AMERICAN BEE JOURNAL

APRIL, 1917

Prune Orchards in Blossom in the Santa Clara Valley, California

PERSONALITY
OF
Lewis Beeware

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Sole Manufacturers

Watertown, Wisconsin

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Vol. LVII.—No. 4 HAMILTON, ILL., APRIL, 1917, MONTHLY, $1.00 A YEAR

Honey Plant Regions of North America

—By John H. Lovell

AT the request of Mr. Frank C. Pellett, State Inspector of Apiaries of Iowa, the writer has contributed to his Annual Report an article, in which he has proposed the division of North America into 12 nectar or honey-plant regions. As this report is intended primarily for the beekeepers of Iowa, it is believed that the publication of a brief description of the proposed regions in a bee journal with a wider circulation is desirable. The regions are based on topography, climate, native vegetation and the geographical distribution of honey plants. The study of honey plants can be carried on to much better advantage by the recognitions of these areas than by States. The point of view in the latter case is often too narrow, and fails to offer an explanation of the occurrence of a species, when if the region is considered its distribution becomes perfectly clear. Merely as a matter of convenience for reference it is much easier to refer to a few natural divisions than to a great number of artificial State areas.

The 12 regions, as shown by the accompanying maps, are as follows:

1. Arctic Region.
2. Coniferous Forest Region.
3. St. Lawrence Basin Region.
4. Appalachian or Deciduous-leaved Forest Region.
5. Prairie Region or White Clover Belt.
6. Southern Region or Cotton Belt.
7. Florida Region.
8. Great Plains Region.
9. Arid or Cactus Region.
10. Rocky Mountain Highlands of Alfalfa Region.
11. California Region.
12. Tropical Region.

The maps are essentially the same as those given in the Report, except that in two or three cases the boundary lines have been changed slightly as the result of more definite information, *e. g.*, the southern end of the line dividing the Prairie Region from the Great Plains Region has been carried further westward at the suggestion of Mr. Pellett.

1. ARCTIC REGION.

The Arctic Region extends southward as far as the parallel of 60 degrees, passing south of the extreme southern point of Greenland, Cape Farewell. It is a treeless land, carpeted with mosses and lichens, with a permanently frozen subsoil; and is of no value to beekeepers. In localities there are dwarf alders, birches and willows, a few heath-like shrubs, such as blueberries and Labrador tea, while herbaceous plants are represented by a few hardy grasses, saxifrages, Compositæ, pinks, crucifers and the conspicuous Iceland poppy. For much of the year these barren tundras are swept unchecked by icy winds.

2. CONIFEROUS FOREST REGION.

From Labrador westward to the shores of the Pacific there extends a vast uniform coniferous forest, composed chiefly of white and black spruce, fir, juniper and pine, with which are associated alders, birches and poplars, while willows grow thickly on the banks of streams. In the southern portion small apiaries are maintained by the experiment stations in Manitoba, Saskatchewan, Alberta and British Columbia, but the region as a whole offers little of promise to bee-culture. The principal sources of honey are willows, maples, dandelion, white and alsike clover, fireweed, alfalfa and goldenrod.

3. ST. LAWRENCE BASIN REGION.

This region includes New Brunswick, New England, New York, Michigan, northern Wisconsin and southern Ontario and Quebec, or the territory lying around the Great Lakes and the St. Lawrence river. The conditions in the eastern section are much less favorable to beekeeping than in the western. The early honey flow is largely dependent on the clovers, while in the fall goldenrod is probably more valuable here than elsewhere in the country. Sumac and tobacco are of local importance in Connecticut. In New York there are extensive areas of buckwheat and fruit bloom. In southern Michigan, clover and basswood are the main sources of honey, in the northern part of the State fireweed and raspberry. Basswood was formerly much more valuable than at present.

4. APPALACHIAN OR DECIDUOUS-LEAVED FOREST REGION.

The eastern United States enjoys a uniform and abundant rainfall, which in the highlands of the Appalachian Region supports a magnificent deciduous-leaved forest unequalled elsewhere in North America. In the number of species and the size of the trees it is surpassed only by the forests of the tropics. Within an area of a square mile 75 species have been counted. As would be expected the principal honey plants are trees, as three species of basswood, sourwood, tulip tree, sumac, locust, Judas tree, Magnolia, maples, persimmon honey locust, holly, horsechestnut, willows, besides a great variety of wild and domesticated fruit trees, shrubs and berry plants. The three most important honey plants are sourwood, tulip tree and clover. Sourwood, which extends from Pennsylvania to Georgia, is by many assigned the first position, being widely distributed and yielding nectar most freely. Many beautiful shrubs abound, as Azaleas, Rhododendrons and Kalmias.

5. THE PRAIRIE REGION OR WHITE CLOVER BELT.

The Prairie Region includes eastern Dakota, Minnesota, southern Wisconsin, Iowa, Illinois, Indiana, western Ohio, Missouri (not strictly a prairie State) and northern Kentucky. This is a treeless area, except along the water courses and where it merges into the Appalachian Region. The surface is partly level and partly rolling, and was formerly the bottom of a great inland sea. The soil is rich and deep, fine and compact, and supports a luxuriant growth of grasses. The soil and climate and the absence of extensive forests are most favorable to the growth

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of white clover, which throughout this region in favorable seasons yields an enormous surplus; while in the arid regions and highlands it becomes comparatively unimportant. Sweet clover and heartsease are also most valuable in these States, while in the lowlands or river bottoms there are splendid displays of hardy Compositæ, as Spanish-needles, sunflowers, asters, goldenrods, crownbeard, Rudbeckia and Grindelia.

6. SOUTHERN REGION OR COTTON BELT.

In this vast region (see maps) there grow annually millions of acres of cotton, offering a bee-pasturage which in extent and richness can be equalled by few other economic plants. The honey flow lasts from July until long after the first frosts. The secretion of nectar is influenced by soil, climate, rainfall, etc., but is most abundant in rich alluvial valleys, where 100 pounds per colony is obtained in good seasons. Southeastern Texas contains thousands of acres of fruit trees, cotton, horsemint, broomweed and basswood. On the lower coast rattan vine yields a dark honey unfit for table use. In Louisiana there are tupelo, horsemint, goldenrods and asters; in Alabama titi, gallberry; in Georgia tulip tree, tupelo, titi, saw palmetto, asters and goldenrods, while hundreds of acres of the coastal plain are covered by the dense thickets of gallberry.

7. FLORIDA REGION.

Florida might very properly be united with the Southern Region, but the great southern extension of the peninsula carrying it into the Tropical Region and its many miles of coast have produced so peculiar a honey flora that it deserves to be recognized as a separate region. The most important sources of honey are trees, tupelo, orange, palmetto and black mangrove yielding the best products. Black mangrove and manchineel are tropical trees growing on the southern coast, and the cabbage palmetto and citrus areas are also confined to the southern half of the State. Tupelo is abundant in the Appalachicola river. Other honey plants are wild pennyroyal, titi, partridge pea, and Andromeda. There are thousands of acres of savannas in Florida, tangled jungles of grasses and weeds, mostly Compositæ displaying great sheets of golden yellow flowers sufficient to keep thousands of colonies of bees busy.

8. GREAT PLAINS REGION.

While a part of this region is highly productive, much of it is semi-arid and covered with sage brush. There are few trees except along the streams and in fertile valleys, and there are great extremes of heat and cold. The northern portion is not well adapted to bee-culture, and in 1910 only 79 farms in Northern Dakota reported bees. Heartsease is the source of great quantities of honey in Nebraska, in which State 157 honey plants have been listed, but no attempt has been made to distinguish between those which are valuable and those which are of minor importance. Alfalfa is of little value except along the rivers. In Oklahoma the principal honey plants are sweet clover, sumac, heartsease, raspberry, locust and alfalfa. The Rocky Mountain honey plant is also much prized in sections of this region.

9. THE ARID OR CACTUS REGION.

Western Texas, northern Mexico, New Mexico, Arizona, lower Nevada and Lower California are largely a desert or semi-arid region with a very scanty rainfall. Northern Texas is a sandy plain destitute of trees and streams. With an annual rainfall of from three to five inches, extreme aridity prevails over much of Arizona, and in this State and the province of Chihuahua, in northern Mexico, there are over 150,000 square miles of desert land. A great variety of Cacti, an exclusively American genus, in every form and shape, ranging from the size of the finger to tall candelabra 30 feet high grow over or completely cover portions of this region. The prickly pear (*Opuntia Engelmanii*) yields a surplus of light yellow honey. Other plants are Yucca, Agave, mesquite and creosote bush. The mesquite, often the only tree found in these desert regions, extends from Trinity river, Tex., to the San Bernardino Mountains and northward to Colorado. In New Mexico, immense tracts of land are covered with Yucca, and many species of Agave occur in Mexico.

10. ROCKY MOUNTAIN HIGHLANDS OR ALFALFA REGION.

The larger part of these highlands is arid or semid-arid, and agriculture is universally dependent on irrigation. The flora is sparse and vast expanses are covered with sage brush. Throughout this region alfalfa is grown very extensively, and is easily of first importance as a honey plant. The factors controlling nectar secretion are not fully understood, but it is well established that in a semi-arid region calm hot weather following irrigation will ensure a good flow. In Colorado there is truly a lavish display of flowers and

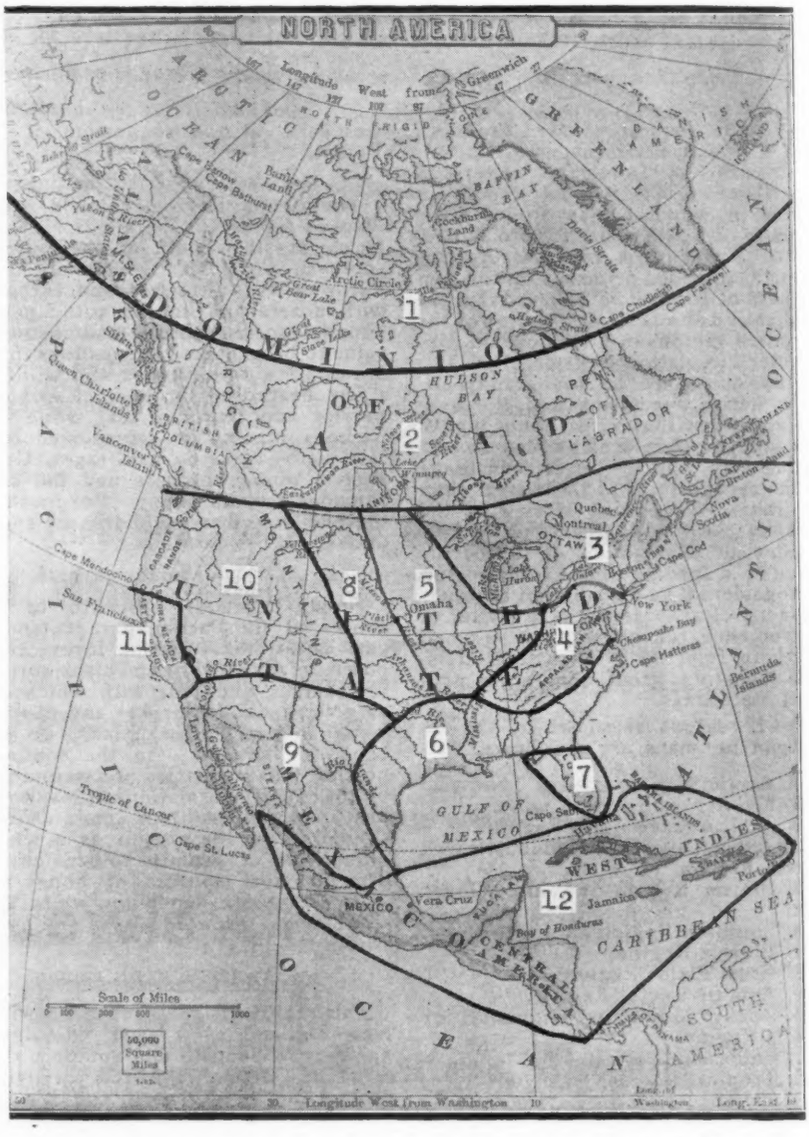

FIG. 1.—THE HONEY PLANT REGIONS OF NORTH AMERICA
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many of the Compositæ are doubtless helpful honey plants. In Washington and Oregon there is a greater rainfall, and the mountains are covered with a magnificent coniferous forest, and there is a great variety of shrubs and herbaceous plants, which are sources of honey. Along the coast of Oregon vine maple and a fireweed are valuable.

11. CALIFORNIA REGION.

No other State within an equal area contains so many species of plants as California. On the Coast Mountains are the famous redwoods. In the beautiful valley of California the meadows and foothills are carpeted with hundreds of beautiful flowers, lilies, buttercups, lupines, poppies, Godetias, and endless Compositæ. To the eastward of this valley the Sierra Nevada rises to the height of 15,000 feet, bearing on its slopes the finest coniferous forests in the world, composed of giant Sequoias, pines, firs and hemlocks. The rich honey flora of California supports more than 200,000 colonies of bees. There are some 50 species which yield a surplus in an average season, foremost among which are the sages and alfalfa. Over 40 of these are herbs and shrubs and the balance trees. Fifty more species, at least, are important to bee-culture, while many foreign plants have been introduced, like the Eucalyptus, which may prove very helpful in the future.

12. TROPICAL REGION.

For convenience southern Florida has been included in the Florida Region, but black mangrove, manchineel and mahogany are tropical trees, and so are the cultivated cocoanut palm, the mango, and custard apple. Among the honey plants of Cuba are the campanillas (*Ipomoea*), mango, citrus fruits, royal palm and coffee tree. In Porto Rico there are logwood, mangrove, mango, guava and guama. Guama (*Inga laurina*) is considered the best honey plant; it blooms several times a year and the bees are never able to gather all the nectar. The tropical forests of the mainland contain more than 100 kinds of trees, many of which are doubtless nectariferous. Logwood fringes all the lagoons and much of the seaboard of Yucatan. Only a glance can be given the tropical flora, which is evidently rich in nectariferous trees.

In the present paper only a brief outline of the honey plant or nectar regions of North America has been attempted. In many instances very little information is available in regard to the honey flora of extensive areas. There are scores of questions which can be answered at once in regard to honey plants by the comparison of the soils, climates and floras of these different regions. There is no difficulty in understanding why white clover reaches its maximum development in the Prairie Region, or why trees are the chief sources of nectar in the Appalachian Region, or why the tropical mangrove and manchineel are confined to southern Florida, or why mesquite, the cacti and other xerophytes are found only in arid areas. It is believed that the different regions are natural divisions, and that this arrangement will prove an incentive to the further study of the North American Honey Flora.

Waldoboro, Maine.

Inspection Work in Illinois

BY C. F. BENDER.

I HAVE read with interest Mr. Frank C. Pellett's article in the last issue of the American Bee Journal. Being one of the inspectors in this State, and having studied the same problems from every angle, I feel like saying a few words in reply.

With much of his article I entirely agree. It is true that our appropriations are too small, that there is some difficulty in getting good men for the work, that some bee owners will resist inspection or fail to carry out instructions. It is true that the pay is too little, and therefore that a first-class man cannot afford to give his whole time to the work. On the other hand, I have some fault to find with Mr. Pellett's conclusions, and with his proposed remedy. He suggests the holding of apiary demonstrations, where the beemen can be taught *en masse*. The only fault with that plan is that the very men who most need instruction will not attend.

We have no difficulty with the intelligent and progressive beekeepers who will attend conventions and field meetings. In fact, these are the very ones who insisted on this inspection work at the beginning, and who furnish the power that keeps it going. The men who harbor and spread disease are most often farmers, or men too old to work, who keep a few colonies, who know nothing about diseases of bees. When a colony dies they set out the combs for the other bees to clean up, or leave the hives open and exposed which is nearly as bad. Such people do not attend meetings to be instructed in bee-culture. They have kept bees from boyhood, and are sure that they know all about it.

No doubt Mr. Pellett, being a good public speaker, finds it more to his taste to address an audience, who come to him voluntarily. He can perhaps do more good in that way. Myself, not being a good public speaker, but having especial talents for private instruction, get much better results from visiting the delinquents, giving the instruction that each one needs, and showing him how to adapt it to his own circumstances. I have induced several troublesome parties to give up trying to keep bees, giving or selling the remains of their stock to some neighbor who was capable of treating them. In such cases I never appear as the officer of the law, but as the impartial friend of both parties. As Mr. Pellett says, much diplomacy is needed. Often a very stubborn man may be conquered by an apparent surrender; he will give generously to the very thing that he has refused on a show of force. It is necessary to judge the man.

There are a few people who wish to injure their neighbors, who will knowingly keep diseased bees for that very purpose. Such people are always cowards, and take their mean revenge only because they have not the courage for open warefare. In such cases the police power is necessary for the inspector. I have found only two such cases, and both gave in when I read over the law to them, showed them that resistance to the State was useless, and would merely cost them a fine, and possibly the destruction of their bees also. An inspector without power to enforce the law, it seems to me, would be much like a policeman who had no power to make arrest, who could only advise people to be quiet and keep the peace.

In regard to Mr. Pellett's plan of a straight salary for the inspector, my objection is unless another man is employed to inspect the inspector, the salary will be paid, whether the work is done or not. The office of bee inspector will inevitably drift into the class of political jobs, which pay a salary, but require no work, known from of old as sinecures.

Newman, Ill.

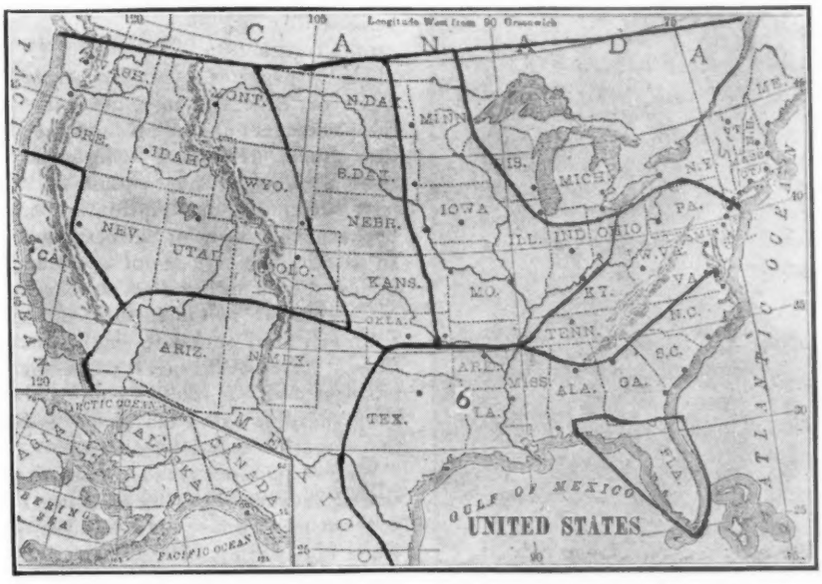

FIG. 2.—HONEY PLANT REGIONS OF THE UNITED STATES
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C. P. Dadant, Editor.
Dr. C. C. Miller, Associate Editor.
Frank C. Pellett, Staff Correspondent.

IMPORTANT NOTICE

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THE EDITOR'S VIEWPOINT

The Goldenrod as a Honey Producer

We have often made the remark that the goldenrod yields no honey in this part of Illinois. Many people of other regions have said the same thing. We thought it was a matter of climate, but it is so indirectly only. It is a matter of variety. At the Toronto meeting, a large number of varieties of goldenrod were shown, and I recognized our variety *Solidago canadensis*. The report was made that this variety does not yield honey in Ontario either.

I thought it might be well to give a list of the different varieties of this plant. But when I referred to the last edition of "Gray's Botany" I found in it the description of 57 different *Solidagos*. It makes me wonder whether I have really recognized our local as *Canadensis*.

Wide Spacing of Frames

The reader will remember that in our December number the Editor called attention to remarks made by Allan Latham, of Connecticut, on the spacing of frames 1⅜ inches compared to the 1½ spacing used by a few apiarists.

Concerning this question of frame spacing, P. C. Chadwick has the following to say in Gleanings, page 125:

"If short of combs in the extracting season, go to the brood-chamber and remove a frame from each 10-frame colony. By the time the brood hatches from them they would be of little value as brood-combs unless the flow were exceptionally long. Moreover, 9 frames in a 10-frame body will often produce more brood than 10 frames; for unless they are perfectly straight and evenly spaced there is often a crowded comb that will not be used for brood anyway. Self-spacing frames are an exception; but the majority of frames in this State are not self-spacing. When the flow is on, combs are a great asset and add materially to the honey crop if they are needed badly."

A 10-frame hive the combs of which are spaced 1⅜ inches would be 13¾ inches wide inside. Using only 9 frames would give each frame 1½ inches of space with a ¼-inch space to spare. So a regular factory-made 10-frame hive may be used for 9 frames and secure the wide spacing. But if this wide spacing is beneficial, why not make our hives a trifle wider and still have 10 frames in them?

Mr. Chadwick is a beekeeper of experience and his statement is valuable.

Beekeeping in Carniola

Mr. Frank Rojina, in his interesting article on bee-culture in Carniola, calls our attention to a fact that is too much shadowed by the fame of Dzierzon. Mr. Langstroth, himself, reported the fact that Jansa discovered that young queens leave their hives in search of drones, long before Huber's investigations. This is mentioned on page 57 of our "Revised Langstroth."

So we gladly insert and repeat the statement which he makes that Anton Jansa is called the first great beekeeper and Dzierzon only the second by those who have been acquainted with the facts. This does not detract from the fame of Dzierzon, for his discoveries were original, and it was through him that the facts became well known to the mass of beekeepers. How few there are who can really lay claim to an original discovery may be realized from this occurrence.

FRANK ROJINA.
Who is a son of the Editor of the Carniolan Bee Journal, is in America working as assistant to Prof. Jager at Minnesota.

Honey Prices

The beekeepers are themselves responsible for the low prices that prevail so frequently. If they could be persuaded to hold for reasonable prices instead of selling at the first offer it would be an easy matter to get a living price. Too many sell at retail for wholesale prices. One of the large bottling concerns recently offered 10½ cents per pound for a carload of white clover extracted honey and failed to get it at that. As long as beekeepers will peddle their honey around the country at from 8 to 10 cents per pound in five-pound lots there is little hope that the big buyers will pay a decent price.

The man who retails his honey at 10 cents per pound as some even boast of doing, has no argument to offer when a bottling concern offers 7 cents in a wholesale way. A buyer could not buy a carload of honey at 7 cents, pay for bottles, labels, packing, etc., and sell at retail at 10 cents without losing money on the transaction.

The prospect for higher prices for next year is very good indeed if only the beekeepers can be made to see that they should demand a living price for their product. They should at least have sufficient consideration for other beekeepers to keep up the retail prices. In the middle West not a pound of honey should be retailed at less than 12½ cents per pound in 10-pound lots, or 15 cents per pound in smaller quantities. If the beekeepers will exercise business methods in disposing of their crop, there is every reason to believe that good prices can be obtained.

We warned our readers not to get scared because of the big crop last season, but many did. Some sold the best white honey at 5½ cents, when if they had taken our advice and held on they would have sold it for 9 or 10 cents in large quantities. If we don't get a living price let us put the blame where it belongs—on ourselves.

L'Apicoltore's Fiftieth Year

The above mentioned publication is now entering the 50th year of its life. It is the official organ of the Italian Central Association of Beekeepers, and has been sent to us as honorary members of this association since its third year, 1870, a period of 47 years. It is one of the most progressive bee magazines in the entire world. Its January number contains translations from Gleanings, from Dr. Phillips' book, "Beekeeping," from the American Bee Journal, from the British Bee Journal, with quotations from some of our leading writers, such as Dr. Miller, W. D. Wright and others.

The January editorial of this magazine mentions the names of a few leaders who have helped to organize Italian beekeeping but who have disappeared: The microscopist Gaetano Barbo; B. Crivelli; Dr. Dubini, author of L'Ape (The Bee); C. Fumagalli; Chas. Dadant; Dr. Metelli; A. Cadolini; Profs. Barbieri, Clerici and Mona, the last named a noted exporter of Italian bees; and lastly Rauschenfels, late editor of L'Apicoltore. Count Visconti, who is still living, is another of the early workers. But the future is to the young men, under the direction of V. Asprea, the present editor. Our good wishes go to the generation who will continue the work of the elders. There is always room for progress and Italian bee-culture will hold its rank. The Italian bees have a reputation throughout the world, and the Italian apiarists will remember that "Noblesse oblige."

Two other magazines, "L'Apicoltura Italiana" and "L'Apicoltore Moderno," are helping the good work.

Queen-Rearing in Italy

We have before us a "Manuale di allevamento delle api regine" (Manual of Queen Rearing) by Vincenzo Asprea, the able editor of L'Apicoltore. It is a small book of 243 pages, gotten up in the neatly artistic manner customary in artistic Italy.

This work is a resumé of the different methods in vogue for the rearing of prolific queens of best honey-producing qualities and should be commended to the Italian apiarist, for whom it is fully as important as such work would be in any country, since the entire world looks to Italy for high grade bees.

The Doolittle method, the Alley method, the Pratt (Swarthmore) method are all explained, with quotations from Sladen, Giraud and other experimenters who have suggested improvements.

Thus far only a few Italian breeders have followed modern methods in queen-rearing, but they are leaders. The book mentions our well-known friends, Penna, G. Piana and Piana Brothers, as well as Messrs. Malan and Bozzalla. But it is to be hoped that the study of as thorough a treatise will induce many other Italians to adopt the latest modern methods.

Our kind friend, Dr. Triaca, has our thanks for sending this excellent treatise to us.

Seventy Years of Beekeeping

The 4th installment of "Seventy Years of Beekeeping" will not appear until May, owing to lack of space. There will be at least two more numbers of it.

Preserve the Bee Magazines

A few days ago I was astounded and highly pleased to receive a letter from our good Italian friend, D. Barone, now at Medina, Ohio, asking me for the loan of the past five years of the Italian bee magazine, "L'Apicoltore." Luckily I had those five years, not a number missing, in spite of the submarines. I have 46 years of this magazine in my library. I was about to send the entire lot to the bookbinder when this request came. They will be bound by and by and placed side by side with the entire files of the Revue Internationale d'Apiculture, Gleanings, and our own American Bee Journal. We have also all of L'Apiculteur, The Review, and a score of other lesser lights. Keep your bee magazines. In years to come it will be a delight to peruse them again.

Michigan Life Members

On page 11 of our January number, mention was made of the election of C. P. Dadant as a life member of the Michigan Association in company with A. I. Root and Dr. C. C. Miller. This information was imparted to us by E. D. Townsend, who had modestly neglected to say that he was also elected a life member at the same time and for the same reasons, "Services rendered to beekeeping." We now correct the apparent omission of his name in the list, and since

"On their own merits modest men are dumb,"

we take this opportunity of saying that Friend Townsend is publishing an excellent magazine, the "Domestic Beekeeper," which is taking the place of the "Beekeepers' Review," and bids fair to become as valuable as the Review was in its best days. We feel proud of his company on the list of life members of the oldest State Association of beekeepers in the United States.

Obituary—David Clayton Polhemus was born Dec. 7, 1861, at Silverton, N. J., and died Feb. 13, 1917, at Lamar, Colo., aged 55 years, 2 months and 6 days.

He and his brother Charlie went to Nebraska in the spring of 1883, and in the years following his brother John and wife also went to Nebraska, and the three brothers were among the early settlers of Harlan county.

On April 17, 1889, Mr. Polhemus was united in marriage to Christina Peterson, and to this union were born three children, Clayton David, Edgar Charles and Millie. In the spring of 1895, the family moved to Las Animas, Colo., and in a short time baby Millie died. In May, 1900, the family moved to Lamar, and in April, 1902, the mother was called to her heavenly home.

In August, 1904, Mr. Polhemus was married to Cora Douglas, of Topeka, Kan. Since this time Lamar has been his home.

Mr. Polhemus had but returned from the meeting of the National Beekeepers' Association, being elected vice-president of the organization and also president of the Industrial Section. At the time of his death, he was president of the local school board; his activities along educational lines have always been the admiration of his fellow citizens. He is survived by his wife and and one son.

Don't Neglect the Bees

In all our Northern and Middle States, April is the month for examining colonies, making sure that they have laying queens, enough honey and pollen and sufficient poplulation to carry them to fruit bloom.

Be sure and examine all dead colonies, closing up the hives after having removed the dead bees. If there is any disease of the brood in your vicinity, be sure and examine the combs of all that have died. Where there is any dead brood a very careful diagnosis should be made. If there is a ropy foulbrood or any doubt concerning dead brood, send samples of it to Dr. E. F. Phillips of Washington, D. C., for determination of the exact condition.

Missouri Foulbrood.—Dr. L. Haseman, State Entomologist at Columbia, Mo., would like to correspond with beekeepers who may have foulbrood among their bees, in view of treating them and also of making experiments upon the disease. He will gladly extend his help to any Missouri apiarist who will write him if in need of instructions.

No. 5.—Among Eastern Beekeepers

BY THE EDITOR.

ON Aug. 23, I again started from Albany with Dr. Gates, although the field meets were all over. This time we were bent on visiting leading beekeepers around Syracuse.

Starting at 9:00 a.m., we traveled the entire distance, 150 miles, before 6:00 p.m. Fine roads, no dust, no mud.

Coming to the outskirts of a city, about midway, we noticed two policemen who signaled for us to stop. We looked at each other, wondering which one of us had committed a crime. As we neared the agents, they glanced at the occupants of the car and at once signaled for us to go on, as if we were not the parties they were looking for. So our curiosity was aroused and we asked what was the matter. "Infantile paralysis," was the reply. At that time this dread disease was raging in the large cities, and they were on the lookout for children coming from infected spots. Farther on we noticed the same solicitude, also warning signs, and when I left Syracuse three days later, half a dozen hospital nurses labeled "Inspectors of Health," were awaiting the arriving train to examine all suspects. It is by such methods that this terrible scourge has been restricted so as to cause comparatively little damage. It is by somewhat similar action that the bee diseases may be lessened and overcome. The few beekeepers who object to apiary inspection should understand that such inspection, if managed by practical and well informed officials, is not only advisable but indispensable in these days of active traffic in both bees and honey.

Syracuse, located in the center of a fertile valley, has successful beekeepers in all directions. We could not hope to visit them all in three days, and this was the limit of my time. We began with Doolittle and Clark, about 30 miles away.

Our old acquaintance and contributor does not need any introduction. He is five years my senior, and like A. I. Root, L. C. Root, and myself has taken a back seat in the work of the apiary. In his case it was unavoidable, for he has been for years giving his entire time to an invalid wife. This must strike a sympathetic chord in the heart of his brother beekeepers. He is fulfilling a duty.

P. G. Clark, Doolittle's partner, helped by Mrs. Clark, has the care of some 175 colonies of bees and 250 nuclei for queen-rearing. They live within calling distance from the Doolittle home.

In the nuclei, the frames run crosswise instead of lengthwise; that is to say parallel to the entrance, so that the current of air is excluded from all but the front comb. This is what the Europeans call the "warm comb system."

The queens are reared by the Doolittle method, of course. We examined a few that were beautiful. I remarked that I did not care for the looks of a queen if she was prolific and her bees pure and good honey producers. Doolittle replied, with a chuckle, "You like to look at a pretty girl, why not at a pretty queen?" That is true, and pretty queens are not to be despised. Mr. Clark showed me a shipping-cage of his own contriving, arranged for shipment to foreign countries. It seems to be the prevalent opinion that queens are often stifled to death in the mail sacks. His cages are square and have openings for air on all four sides and the top and bottom, which lessens the chances of suffocation.

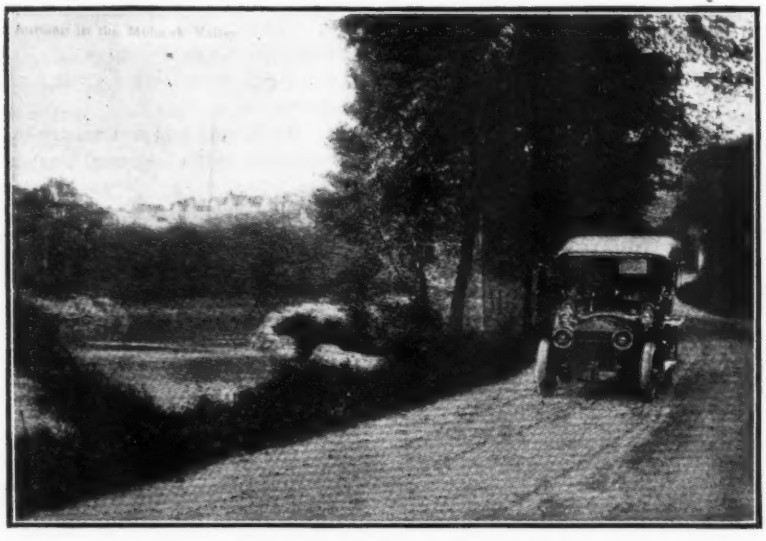
He has a simple way of preserving combs. We all know that moths rarely lay eggs in a comb which is exposed in the open air. So he has racks under the projecting eaves of his honey house and the combs are hung there winter and summer. A few were there, when we came, and I examined them. They were perfectly free of moths though they had been there since the previous fall. The outside ones looked rather weather-beaten, but sound.

For the benefit of those of our readers who think it is unworthy of a beeman to wear a veil, let me say that although their bees are very peaceable, Doolittle wears a veil all the time in the apiary. His veil is fastened to the rim of a straw hat and is held at the bottom by weights at its four corners. In this case the weights were iron nuts of ¾-inch size, a very simple fastening.

The crop was good and we saw a fine lot of clover honey. There as elsewhere it was white and alsike clover. Buckwheat is plentiful in the fall.

I learned there that bee eggs could be safely shipped quite a distance without hatching if kept on ice. They shipped eggs in this way to Dr. Gates, and he reported that they had arrived safely and hatched well, after four to six days.

We were entertained with great hospitality by Mrs. Clark. Before leaving we visited the Doolittle sugar-bush, a grove of fine hard maples interspersed with basswoods, only a few rods from



ALONG THE MOHAWK VALLEY

MR. DOOLITTLE DISCUSSING BEEKEEPING WITH MR. AND MRS. P. G. CLARK

the apiary. Maple sugar and honey make a good combination for a beekeeper to sell.

S. D. House, of Camillus, was the next man on our program. Mr. House is a very extensive beekeeper, who believes in the sectional hive and a small brood-chamber. He appears to do very well with both, as we saw tons and tons of honey. But what a lot of swarming! He told us of having had 18 swarms come out at one time, if I am not mistaken. His success with bees is an evidence that it is not so much the implements as the beekeeper's system which makes for success.

Mr. House places his yards four or five miles apart. That indicates how far he believes bees will go for honey. But he gave me a new idea on this point. He believes that bees go farther for strongly smelling blossoms, because these can naturally be scented farther away, of course. This reasoning is so obviously and plainly correct that I do not understand why we did not think of it ourselves. That is why, in buckwheat sections, the bees are claimed to travel farther than in many other sections, where the honey is less odorous.

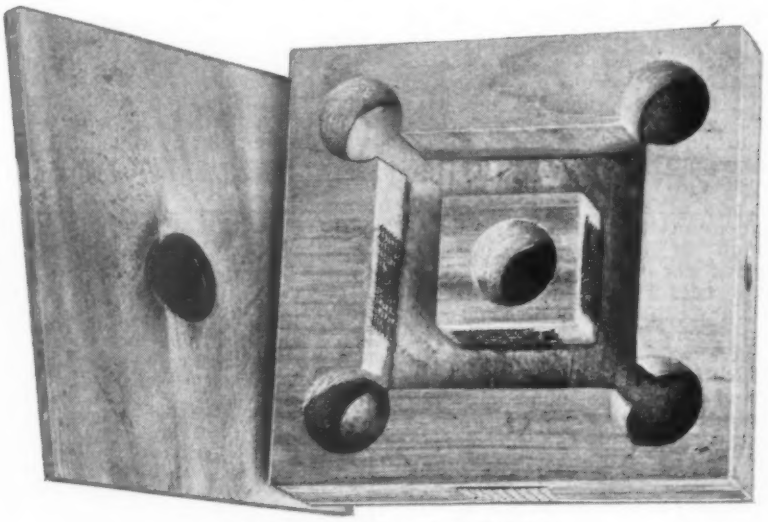
They had an epidemic on adult bees during the spring of 1916, from June 20 to 25, which resembled the Isle of Wight disease, the bees dying in hundreds in front of the hives, without apparent cause. It was during a period of excessive moisture and the affected bees were three weeks old or older. Some colonies were very much weakened by it. The reader will remember that a similar trouble was reported from Amherst at about the same date in similar weather conditions.

Mr. House supersedes his queens every year and holds this operation is worth easily $2.00 per colony. He wants late reared queens, so their fertility may be at its highest in the spring. But this is evidently not sufficient to hinder natural swarming.

Our next visit was to Mr. Irving Kenyon, with whom we remained but an hour or two. Mr. Kenyon's honey crops have been subject to a peculiar trouble during the past two years. Some of it ferments in the cells, after it is capped over, and often bursts the capping. The trouble has existed in his product for several years, but has been on the increase lately. He wonders whether it is due to a microbe within the hives, perpetuating itself from year to year, or whether it is due to the location. I thought that it might be due to some special bloom. Can any of our readers suggest a possible explanation? The trouble has been so annoying that our friend thought of resorting to the extreme remedy of transferring all his bees upon sheets of foundation in the spring and rendering all the old combs into wax.

On the morning of another fine day, we visited Mr. Oscar Dines, at his apiary, on a hillside of the Onondaga Indian Reservation. And let me say at once, for the benefit of our foreign readers, that although several hundred Indians are still living there, they are of a very modern type, their women wearing clothes of the latest fashion when coming to the city. Were it not for their broad smooth faces, beardless in all cases, their smooth coal-black hair, their reddish skin, no one could imagine them to be descendants of the proud, cruel aborigenes, depicted less than a century ago by Fenimore Cooper, and living exclusively on the fruit of the chase.

Mr. Dines lives in town. His apiary of some 300 colonies is on a pretty slope, in a good region, a half mile or so from the end of the interurban line. His crop was immense, his bees beautiful Italians, with gentle disposition. He, like friend House, uses a sectional hive, the frames of which hang freely and are a delight to handle; they are so short and convenient. We opened several hives together and he expressed to me his great enjoyment of beekeeping. He is happy among his bees. When he sent me the accompanying photo of his apiary, he wrote in part:



QUEEN-CAGE BY MR. CLARK
Air is given to the bees from every side

DOOLITTLE & CLARK IN MR. CLARK'S APIARY NEAR BORODINO

"Enclosed you will find a remembrance of the pleasant visit we had at my apiary, which was only too short for what we wanted to say. The honey house is in the back ground; the lady is my daughter, Mrs. Parker; the man standing you recognize. The colony that yielded so much honey is not visible in the picture. My honey is all sold and shipped away and everything cleaned up and put in its place ready for next season."

Mr. Dines is the inventor of a very simple swarm-catching device, to be used however only when you are in the apiary and see a swarm in the act of emerging. It consists of a cage made of two boards for a frame work and four sides of wire mesh, with an opening across one end to fit on the entrance of the hive. This cage is placed in front of the colony that is in the act of swarming, and the bees rush into it, since they cannot do otherwise.

If the queen has been caught with it, it is only necessary to carry this cage to the front of an empty hive and the bees will hive themselves. Two or three of these cages, in very active swarming time, give the apiarist quite a relief, as each of them takes care of a swarm without trouble.

The last man visited was Mr. F. W. Lesser, manager of some 800 colonies, scattered over quite a territory. Riding with him in a "Tin Lizzie," we visited an apiary located in the brush of a hillside. The hives were tiered three and four stories high and promised a big crop. Mr. Lesser complained of the same adult bees trouble of June, as we mentioned in speaking of Mr. House. But he ascribes this trouble to unhealthy pollen. Time and experiments only will give us a clue to this problem. He does not think bees work profitably at a distance of over two miles, and says bees located in the basswood timber will harvest twice as much honey as those two miles away from it.

I have now reached the end of my eastern visit. After a short stop in Chicago, I arrived home at the conclusion of the 32d day, glad to have met so many, but gladder still to be among my people again.

Building Up a Strain of Bees

BY G. M. DOOLITTLE.

"HOW may I build up a strain of bees, and what are the dangers of inbreeding?" is a question on which a writer requests that I give my views through the columns of the American Bee Journal. Those who keep bees, with possibly a few exceptions, keep them for the profit they yield; so I take it for granted that the questioner wishes to build up a strain of bees which will give him the most honey either comb or extracted.

When I started in beekeeping, in 1869, there were no "honey bees" to be had in these parts save the "black bees," and they did not come up to the high standard which I desired. In 1873 I procured an Italian queen, reared queens from her and gave these young queens to about half of my colonies. The next year I kept a careful watch of proceedings, and jotted down in an old diary: "I find the Italians proof against the wax-moth. They do not desert their hives in early spring; and whenever a small amount of honey is obtainable they gain in stores, while the black bees require feeding."

Since then I have tried every variety or strain of bees which has been brought into the United States, but found none, for my locality, which could equal the Italians. Having settled on the Italian bee as the best, I found that *even these bees* were not alike profitable. There are few careful observing beekeepers but have noticed the lack of uniformity of yield between colonies. This may be from two or more reasons or a combination of them.

The colony giving the lesser amount may lack enough bees of the right age for gathering. The difference may be in the bee itself. The thorough understanding of the right management of colonies to secure the best results has much to do with the yearly product in honey, and the very best queens obtainable will never be a success where the management is faulty. A management that has no eye toward the date of blooming of the flowers in the locality will rarely give a satisfactory return for the time and labor expended, even with the best bees the world affords.

But let us look at the bee side. From reports and a long experience in visiting different apiaries, I am led to think that the variation in yields is nearly if not quite 50 percent between the 10 highest colonies and the 10 lowest, where the apiary numbers 100 colonies. That the strain of bees has much to do with this is certain; and when apiarists fully realize the difference in stock, the question of breeding will receive as much attention as is necessary for a successful management.

In my early work in the improvement of stock, my thought was that the queen that would lay the most eggs must certainly be the best. The idea proved to be a mistake. Some queens producing not nearly the number of bees that others did would give much better results in surplus honey. A few years of experience will convince the close observer that it is not the most prolific queens that have the strongest colonies at the beginning of the clover flow, or give the most substantial results for the season. These facts being known, it remains for the apiarists to find out the reason. If we cannot account for one colony collecting one-half more or twice as much as another in the same apiary, we can take the short cut and supersede the queens of the less productive ones with the strain which gave twice as much.

It is hardly necessary to argue why

OSCAR DINES, OF NEW YORK STATE

queens should be scientifically bred. "The survival of the fittest" will not develop a better bee than we have now, for she cares for nothing save the perpetuation of the species. How often have I heard apiarists say, "If each colony reached the high standard sometimes reached by a single colony, my honey crop would double." Careful breeding will do much toward this, and with it reduce in proportion the cost of management and equipment. This means a greater profit.

We have been told by the successful honey producers that the introduction of new "blood" helps much by avoiding the evil effects of inbreeding. This, if we accept the theory, can be brought about by bringing home colonies or queens from outapiaries, by exchanging queens with other successful apiarists, or by an occasional purchase of a good queen.

There are many points to breed for, but the most eagerly sought is, as I said at the outset, greater honey production. But in breeding for profit we often run against traits that are almost a part of the bee itself; and to change which would mean to change the bee. To illustrate: Let us take the swarming impulse or the desire for increase. By persistent breeding we can remove some of the conditions which tend to produce swarming, thereby reducing this tendency to as low a point as possible, but to eradicate it entirely seems out of the question. By rearing our queen-cells in colonies whose desire to supersede their queens is uppermost, quite a gain can be made in this direction. The accounting for the difference in productiveness of different colonies is not always easy to tell.

I incline toward the vitality and longevity of the workers of certain queens as being very desirable, as such have the power of continued endurance. When workers emerging from Aug. 30 to Sept. 10 were found doing good work at gathering nectar the next year on June 20, with a few still holding out on July 4, I was not "slow" in taking the hint. I lost no time in rearing young queens from their mother, so that these young queens could replace all inferior stock. When the mother of this long-lived stock showed a disposition to place the maximum number of bees on the stage of action, at the blooming of the flowers which gave a surplus, without any special management or manipulation on my part; and when they entered the sections with the first nectar, without a desire to swarm, I considered this queen of still more value in building up of a strain which should be superior to what I had before attained.

Whenever such a queen is found she should be kept as a breeder, even should she live to be five years old, as did this queen, rather than have her life "snuffed out" annually, as is strenuously advocated by many, in their desire to have each colony presided over each spring with a queen less than a year old. As the queen is fundamental to the colony, we should "strain every nerve" toward better queens. I doubt the wisdom of advocating the "baby nuclei plan," together with the caging of fresh emerging queens from one to eight days, as has been done to a considerable extent during the immediate past, in order that they may be *cheaply* reared and fertilized through a saving in nuclei.

As to the "dangers of inbreeding," asked about by the questioner, when the fact is remembered that to all practical purposes all drones are the "sons of their mothers," this inbreeding matter is little more than a myth. Inasmuch as a queen that has never mated with a drone can lay eggs which will produce drones having full procreative powers, and the mating of the queen seems to have no essential effect on her drone progeny, the grand-daughters of any queen cannot become more than half sisters unless they mate with drones produced by their grandmother. Therefore, if a certain queen is used to rear queens, and another to rear drones, even did the young queens mate with

the desired drones, no inbreeding would be done that need worry the practical apiarist whose ideal is honey production. Then when we realize that drones, for miles around, congregate in certain places in the air, and that our most carefully reared queens are almost sure to go to these congregating places, any danger, for the practical apiarist, of inbreeding need not even disturb his dreams.

Borodino, N. Y.

A Queen Clipping Story

IT was many years ago, on Easter day, during one of those radiant spring days that one appreciates the more because one has missed them so long. The bells of the churches had already announced the solemnity of the day, and my wife had said to me: "I hope you will not fail to come to church today." I had replied hurriedly: "Yes, yes, certainly." But—how it happened I do not know—when the bells were rung for the third time, I was in the apiary opening a hive of bees.

I had six hives of bees in the remotest rear of my garden, and we had a neighbor whose principle it was never to let anything get lost. So whenever a swarm would settle in his lot, he would run and get a straw skep, hive the swarm without saying a word and take it away. There is nothing so vexing as to lose a swarm in the spring, but when you know it has been taken on the sly, it is still worse.

I had read in a foreign bee journal that one could avoid the loss of swarms by clipping the wings of the queens, and this was what I was aiming to do, on that Sunday. At first everything went well, but when a man has handled a spade or a hoe all the week, it is somewhat difficult to hold a queen. They are so frail that one never knows whether one is holding them right or crushing them. Several times it has happened to me to say, in releasing a queen: "There, I killed her!" As I had noticed in that same journal that one could clip the wing of a queen without seizing her, I decided that I would try that method on the second queen. But when the fingers are stiff to handle a queen, they are just as much so for holding scissors. I was holding the frame in one hand and the scissors in the other, following the queen who was passing from one side of the comb to the other, or hiding under the workers. A clip of the scissors is quickly done, but you must do it properly and not clip a leg or the end of the abdomen with the wing. I believe the man who advised that method is a theorist who has never tried it himself, unless he be a legerdemain performer.

I had been following the queen with my scissors for perhaps five minutes when she reached the top of the comb, and probably becoming convinced that I was after her, she took flight just like a hen that you are trying to catch. It was the first time I had ever seen a queen leave the comb; she passed near my face; I looked up to follow her, but the sun blinded me and she disappeared. I hunted for her for a quarter of an hour on a little tree which was near to me; I investigated one leaf after another uselessly. She was lost.

Was it because of Easter day? I had no sooner closed the hive when I heard a voice saying, "Serves you right, you pagan! You imagine that you can examine your bees, unpunished, on Easter! Serves you right! A queen lost, a crop lost, 40 pounds of honey! At 20 cents that makes $8.00! A well deserved fine, not too much!"

But this made me peevish. "Do you think that I have no right to look at my bees when I feel like it? I'll show you." So I opened the four remaining colonies and clipped the wings of the queens by catching them across the corslet. But the thought, "Serves you right," kept ringing in my ears, in spite of myself. The sun did not seem so bright, and things looked gloomy. I put everything in order and walked towards the house, thinking: "Don't tell any one about this at dinner, for the "Serves you right" would be likely to keep alive until next Easter.

I walked into the house. But when I lifted my hat off, I heard a "frr frr," the beating of wings. Oh my, my queen, my queen, there she was, on my hat!! I caught her, ran to the hive and let her run in. I was in such a hurry that I even forgot to clip her wing. The sun had become radiant again and the day lovely. I was so happy, not so much for my crop returned in perspective, but to be able to answer that voice which said, "Serves you right." It seemed to me that I was entitled to reply: "Ha, not so big a sin after all." But just the same, since that day, I have never opened my hives on Easter.

—Bulletin de la Société Romande.

APIARY OF OSCAR DINES, OF SYRACUSE, N. Y.
The largest number of colonies I have seen in one apiary, nearly 300. Mr. Dines enjoys beek eeping hugely

Moving Bees

BY L. L. ANDREWS.

THE moving of bees has become so common over most parts of the United States that I will give only my personal experience, hoping that it may be of benefit.

If the apiary is to be used with the intention of immediate honey-gathering, large colonies must be used. If the apiary is to be built up to honey-gathering strength after moving, other methods can be used.

To move short distances, say up to 50 or 60 miles, tight hives and good ventilation are the prime requisites. I use a screen made of ordinary window screen on a frame made of ⅞-inch lumber to tack over the hive after the cover is removed. Close the entrance with a strip of burlap soaking wet.

I will go more into detail in my description of moving long distances in order to get the later crop. In Utah the honey flow is looked for about July 15, while here most of our honey is made by July 1. By crowding a little each way, we get most of the crop here and get up there in time to get a crop also.

In preparation, a good way is to figure on about one frame of honey, one dry comb, three of brood and honey, a good supply of young bees, and above all a young queen. Nothing is so provoking as to have a queen break down and the bees try to supersede her in the midst of a honey flow that at best is of only a few weeks duration.

Move all colonies some distance a day before you expect to ship, to screen out all old bees. Place some hives with combs and a frame of brood—about one hive for each 20 colonies moved—on the old location to catch the go-backs.

With the hives to be moved, fix all frames secure. If self-spacing, crowd to one side of the hive and drive a six-penny nail in the end of the hive to hold the frames secure. Place the screen over and tack lath on to hold secure. I close entrances by tacking on pieces of lath, leaving a space between the width of a lath. This space a small piece of lath will fill quickly when the hive is ready to close.

Have plenty of help, and when you expect to ship get everything ready and load quickly. Place hives crosswise of the wagon and lengthwise of the railroad cars. Place the hives about three inches apart in the cars, and many leave an aisle so that you can go the full length of the car to water during hot weather. It is yet a disputed question whether it pays to water during shipment, but we have always done so. We used a squirt gun much like we made out of elder when boys.

The best results are obtained by shipping nothing but sealed brood, as the bees will suck the uncapped brood

dry, when the hives become heated.

In placing the hives in the car, put a row of hives across, then put two parallel pieces of 1x2, or larger, the width of the car on the hives and make them secure. If the car is not packed full, brace strongly in the middle, as no one has any idea how much jamming the car will get endwise. And to have a carload of bees get to moving and break open is some trouble, I assure you.

In shipping by rail it is necessary to have an attendant accompanying the car, as bees go as live stock. After arrival at the destination, haul to your location as soon as convenient. Avoid as much hot sun as possible and release the bees at sundown. Sprinkling just before you open the hives will help to quiet them.

If the hives should happen to be on movable bottoms, it would be a great help, as the bees that have died on the trip will be on the bottom and often clog the entrance. If the journey has been long and the weather hot, you may have trouble about the bees swarming out.

I tried moving some strong colonies to Utah, a distance of about 800 miles, but the results were not satisfactory. Moving short distances requires no great amount of knowledge, but shipping hundreds or thousands of miles calls for skill, and those who have practiced it for years still find some room for improvement.

Corona, Calif.

The Prevention of Swarming

BY THE EDITOR.

THERE are many methods in vogue for the prevention of swarming, but they are nearly all by manipulations which require a great deal of time, at the busiest season. The method which we sustain as best and which I propose to describe requires no active manipulations during the honey-gathering period, outside of the necessary ones and is what might properly be called a "let alone" method.

As early as 1870, we found ourselves with a sufficient number of colonies to make swarming undesirable. Besides the objectionable increase, in numbers, swarming caused an increase of labor when we were busiest. The method which we then adopted has been in constant use by us since, with additional improvements. We do not claim that swarming can be prevented altogether, neither do we claim that it is as easy to avoid it in the production of comb honey as in that of extracted honey. But the success of our management during the past season is ample evidence that the principles enunciated below are in the right direction. Out of about 525 colonies, spring count, we gathered less than 30 swarms, but harvested over 200 pounds per colony, while a neighbor of ours, less than two miles from our home apiary, gathered 12 swarms from five colonies, owing to his neglect of proper attendance to their needs. The requirements are as follows:

1. An ample brood-chamber for the needs of a prolific queen. If the queen finds herself confined to a scanty lower story by excluders or otherwise, she will make it known to the bees or they will instinctively notice it themselves and prepare queen-cells.

We use a very large hive, large brood-chamber and large supers. But it is not my purpose to advise beekeepers to change their system and the dimensions of their hives. Even with an 8-frame hive, the prolific queens may be accommodated. Doctor C. C. Miller uses a second brood-chamber for prolific queens and removes this, at the opening of the crop, leaving in the lower brood-chamber the best brood-combs. In some way, the queen should be accommodated during the heavy breeding season, and especially at the opening of the crop.

As an outcome of the first proposition, there must be ample room for stores. Some beginners are astonished to see old practitioners like Dr. Miller giving their bees as many as three supers at one time, on a strong colony. But if the queen is very prolific, and has been breeding plentifully as nature dictates, her colony may be able to work in each of two or three supers as strongly as they would work in one.

2. The use of comb foundation in full sheets in the supers when working for comb honey, or of fully built combs in extracting supers, has also a great deal of influence upon the prevention of swarming. True, full combs are much more efficient in this, but comb foundation aids greatly. There are days when the crop is so heavy that all the available cells are at once filled with nectar. If the bees have to build combs and thus find themselves crowded for room to deposit their loads, swarming may ensue. But with full sheets of foundation in every section, the work of comb building is much simplified and the necessity of producing sufficient wax reduced. Of course, it is understood that the supers have been supplied to the bees before they found themselves crowded for space, for if the swarming impulse is once gained, it is next to impossible to overcome it by any manipulations whatever.

ASHCROFT APIARY OF L. L. ANDREWS

HAULING BEES—L. L. Andrews

3. It will be entirely useless to expect the bees to remain contented and fill the supers, if the ventilation of the hive is inadequate to the requirements of the enlarged population. All observers have noticed the great tax imposed upon them by the simultaneous increase of heat and discomfort brought about by a summer temperature and a daily addition of some 2000 or 3000 hatching bees to the population of powerful colonies. Yet many beekeepers do not think of enlarging the means of ventilation. Thousands of colonies are compelled to leave a large part of their population idle, hanging

on the outside of the hive for days and sometimes for weeks, because they are unable to sufficiently ventilate the inside of the brood-chamber and supers. We must remember that every corner, every story of a hive is in absolute need of a current of fresh air which is supplied at great pains by establishing a line of fanning bees, incessantly forcing pure air in and foul air out. Yet in many colonies there may be but a shallow entrance, partly closed by clustering bees, and perhaps on the inside above the brood-combs there may be some partitions, queen-excluders, separators, honey-boards, etc., all in the way of ventilation. We raise our hives from the bottom, in front, from one to two inches, when there is a likelihood of the bees being unable to ventilate otherwise. We have even set the supers back a half inch or so, during the hottest days, to secure a current of air through the brood-chamber in very hot weather. But this must not be continued too long, for it might interfere with the storing of honey in the front of the supers if the weather changed. The bottom ventilation, however, must be ample, ample enough in fact to allow all the bees to work, so that none will remain clustering on the outside during the continuation of the honey crop.

4. As help to ventilation and comfort by decreasing the heat, a good roof is needed when the hives are exposed to the sun. We use coarse roofs on our hives, even when they are located in the shade of trees. Our roofs are made very cheaply of large discarded dry goods boxes and are flat. They are cleated with 2x2 inch scantling on the rear underside and a 1x2 inch strip under the front end. This secures a slope of an inch, which may be turned the other way to shed water in rear. The roofs are much wider than the hive and shelter the top from the effects of the weather.

5. The queen must be young. Some beekeepers believe in requeening every season after the honey crop. I do not believe in so radical a measure. In fact, I would not feel capable of killing a first-class queen after only one season of use. But I do believe in keeping only prolific queens and if the queen has proven under grade she should be replaced. Old queens who are losing their fertility are a frequent source of swarming. The workers prepare to supersede them, just as soon as they notice their reduced laying, by rearing queen-cells. The old queen in a pique leaves with a swarm. So we must replace our old queens every fall or late summer.

6. A large number of drones is an incentive to swarming. Some of the old-time beekeepers thought the drones were beneficial because the colonies having many drones swarm readily. They considered swarming a desirable thing. So it was, when dividing or artificial increase was unknown. They also thought the drones were useful in keeping the brood warm. So they would be if they did not have to be kept warm themselves when they are reared and also if the bees did not kill them, as they are sure to do, in bad weather.

There is not any doubt that the excess of drones in the hive promotes swarming. Those big, noisy fellows remain in the way, all day long, except for a flight during the warmest hours, being then still more in the way of the active workers. Although, as Dr. Bruennich says, there is a certain fondness of the workers for the drones, during the crop, which changes to hate afterwards when they see them helping themselves from their hard earned stores, yet their numbers make for discomfort and a crowded condition.

In a state of nature, according to the best authorities, bees build from one-seventh to one-tenth of their combs of drone size, in the brood-chamber. If only one-twentieth of the combs of a normal colony were filled with drone-brood, this would supply nearly 2500 drones per colony. We should permit only two or three of our very best breeders to rear so large a number of drones, for 5000 to 10,000 drones are enough for any apiary.

Some beekeepers see no way to destroy drones, but to use a drone-trap. That is to say, during the busiest, warmest season, when their bees need the greatest amount of ventilation, they place in front of the entrance a cage made to catch drones and queens, the very worst encumbrance that may be devised, for the sake of catching the drones as they emerge, having to remove them every evening or suffer the odor and encumbrance of dead drones in front of each hive.

Some other beekeepers think of doing better by cutting off the heads of the drone-brood, in the cells, with a sharp knife. This is a terrible mess. It compels the bees to pull out all those drones and carry them out of the hive. Then the same drone-comb is carefully cleaned and within a day or two the queen again fills it with eggs that will produce a second batch of drones. That is to say, we have spent a lot of energy rearing expensive drones, and now we are rearing another lot.

It is probably impossible to rear no drones at all, but if we remove all the drone-comb, early in the season, as nearly as we can, and replace it with worker-comb, there will be drones reared only in imperfect cells here and there or in out-of-the-way corners. Instead of rearing 2000 or more, we will perhaps rear 200 or less in each colony, a very important difference when we consider the comfort of the colony. Remember that if we leave the bees to their own devices, when we remove the drone-comb, in early spring they will be sure to build drone-comb in the same spot. So it is important to replace it with worker-comb.

It has often been stated that bees will tear down worker-comb to build drone-comb in its place. I believe this is an error of observation. Four different experimenters, to my knowledge, have tried the hiving of a swarm in a hive full of drone-comb. If bees would tear down one kind of comb readily, to build in the other kind, they surely would have done it in these cases. But in each case, the bees followed the same method. They did not tear the comb to rebuild it, but only narrowed the mouth of the cells to worker size and the queen laid worker eggs in them. The names of the experimenters who tried this are: E. Drory, of Bordeaux, former editor of the Rucher Du Sud Ouest; Mr. Thomas W. Cowan, editor of the British Bee Journal; Dr. Bruennich, of Switzerland, and myself.

There are instances, however, of bees building drone-comb on imperfect worker foundation. They are rare and are usually due to some defect of the foundation, which may have been stretched slightly in laminating. At the meeting of the beekeepers of Middlebury, Vt., the past summer, Mr. Crane mentioned having had about a dozen sheets of foundation thus changed, out of some 2000 used by him the past summer. These are only accidents. Accidents also are instances of bees building drone-cells on one side of the comb, while worker-cells are on the opposite side. In such a case the regular base is not followed and the cells lap over, showing plainly that they were irregularly built. Mr. Latham exhibited to me two square inches of such comb during the summer of 1916. These are only accidents. Such combs should be remelted and replaced by well built combs.

When we replace the drone-comb with worker-comb in all but our best colonies, we do away with undesirable drones, for the mating of the queens. We save food which would be wasted on these undesirable beings, since the drone costs at least one-half more to rear than a worker, and has to be fed as long as he lives.

Replace the drone-comb with worker-comb, as much as possible in your

ONE OF L. L. ANDREWS APIARIES IN THE WILD BUCKWHEAT

hives, early in the season and you will have much less to fear of the swarming fever.

7. The last condition which I can mention in the successful prevention of swarming is one which we have been using for years, but which I did not think of in that connection until the matter was brought to my attention by Mr. Allan Latham, the past summer. In exhibiting a hive at the Storrs meeting, Mr. Latham made the remark that the 1⅜ inch spacing of combs, from center to center, in common use, was a promoter of swarming. We have used the Quinby spacing of 1½ inches ever since 1866. The bees work as satisfactorily with the one spacing as with the other. In fact, the original advisors of either mode of spacing had no very positive argument to advance in favor of their method. But the 1½ inch spacing gives ⅛ of an inch additional between all the combs for the bees to cluster or move about during the breeding season. This multiplied by the height and length of the hive and by the number of frames gives an addition of 162 cubic inches of clustering space or ventilation, as the case may be. Think of the large number of bees which may be accommodated in such a space.

The standard hives of the present day are nearly all of the narrow kind. Nevertheless, the broader spacing is much the better, for the above named reason and also because it gives easier manipulation and more clustering space for the colony in winter. As I have said, we used the wider spacing for years, but I did not realize that our success in swarm prevention was in part due to this spacing. It is undoubtedly of great advantage in the prevention of swarming.

Let it not be understood that I lay any claims to the total prevention of swarming. That is a goal never to be attained. Neither do I lay any claim to breeding a non-swarming strain. But when some of our most practical beekeepers, such as I have met in the East, acknowledge, as one did, having had as many as 18 swarms out, at the same hour, in one apiary, I believe there is need generally of a more thorough understanding of the causes of natural swarming.

The advantages of this method consist in doing away with numerous hive manipulations during the honey crop, such as cutting out queen-cells, taking out brood, shifting colonies, returning swarms to the old hive, etc. All the required work outside of increasing the opportunities for ventilation and adding supers, has to be done during the dull season. I know that those who have excessive swarming, if they try these conditions, will find themselves greatly relieved by the results. Besides, they may be able to discover additional requirements, for there is always something more to be learned. If we are to judge of future progress by the past, there are endless opportunities for more knowledge, endless chances for progress.

MY NEIGHBOR'S PRUNE ORCHARD—(Photo by John R. Douglass)

My Neighbor's Garden

BY C. D. STUART.

I WOULD hesitate to call my neighbor a bore, as defined by a witty Frenchman. But whenever I attempt to talk about *myself* and my honeybees, he manages to switch the conversation to *himself* and his prune trees. I had been awaiting the opportunity to tell him that nature has no more effective pollinator than bees, and that without them he would have had no prunes to talk about; but the University beat me to it. A copy of their latest bulletin was sticking out of my neighbor's pocket when he arrived at my cabin on an errand of state—the negotiating of closer relations between his trees and my bees.

"Listen!" he began, excitedly shaking the bulletin in my face; "here's an old highbrow claiming that one colony of bees will pollinate 9991 prune blossoms. Yes siree, a genuine University guy!"

"You mean, one colony can pollinate one acre of trees, don't you?"

"No; blossoms. Man alive, just think of the number a hundred colonies would pollinate! If one tree has 9991 blossoms, 20 acres of trees would have——" There he stopped, found a newspaper and began to figure, on the margin, the benefits—to his prunes—of the proposed alliance.

With my neighbor, the juggling of figures has been elevated from mere pastime to the realm of accomplishment. He fairly "eats 'em." A scrap of paper, a stubby pencil, and millionaires spring into existence while you wait. Or, the same computations, done backward, and bankrupts are created with equal dispatch. It is not surprising, then, with such facilities at hand, that he himself has arisen—on paper—from the ranks of the small rancher, to the multi-millionaire class.

As for me, bankruptcy is a chronic condition, my neighbor having long since figured my bee ranch in the hills clean off the map, even pursuing it with strange-sounding words — one, more hostile than all the others, "depreciation," which, applied to any healthy enterprise will, in time, cause it automatically to disappear. By this mysterious calculation, I had already lost more money than in the wildest dreams I ever hoped to possess. (Luckily for me, the amount and price of my honey during this period of progressive disaster, remained normal.) Moreover, in his estimation, a beeman is a reproach to his family, a menace to the public and, socially, on a level with the herders of sheep and goats. To be strictly just, however, that is only my neighbor's *theory*. In *practice* his friendship has survived all handicaps.

On the other hand, my neighbor's fat valley land at "only $500 an acre," was about to be doubled, perhaps quadrupled, if the newspaper margin would only hold out. For if 1069 blossoms counted in the University experiment, could mature 193 prunes, nine times as many prunes would mature from 9991 blossoms, or over 1700 prunes to the tree; and with 100 trees to the acre of trees, he would harvest 3,400,000 prunes. Even now my bees stood only on a commercial footing, but at least they had been recognized. Somewhat saddened, I left my neighbor to his figures, and turned to the shimmering landscape with its background of purple hills framed by my kitchen window.

It was Blossom Day—California's unique, all-embracing, outdoor, democratic Easter, when all the earth is athrill with new life; a day that "when the ardent sun rides high, above the waiting trees; like fleeting clouds athwart the sky, range forth my honeybees, my resurrected honey-bees," unconsciously to fulfill their mission.

All Santa Clara Valley was in its Easter frock, and throngs of visitors from far and near had gathered to witness the ethereal spectacle, before the ocean breeze should spirit it away. And somewhere in the heart of the Valley nestled my neighbor's prune trees, adding their quota of loveliness to the Annual Festival of Blossoms. But the miracle was lost on the man whose mind's eye saw only additional trays filled with fruit drying in the sun, that my bees would make for him.

"Millions in it!" he muttered, feverishly setting down the final additions on a fresh bit of margin. "Why didn't you tell me?"

"Never had a chance," I retorted.

But my neighbor characteristically waved all past losses, in favor of future gains. "Three million, four hundred thousand prunes!" he repeated, "and with 40 prunes to the pound——"

"The more you get the smaller they'll be," I reminded him.

"—— will make 85,000 pounds—three times last year's crop—and if the price should go to 15 cents a pound, they'll be worth $12,750. Gee; I'll lift the mortgage and buy a Ford!"

"I don't think I care to move my bees," I concluded.

"W-w-hy? Plenty of room, and you're welcome to it."

"Truck man charges two bits apiece to haul 'em, and bees get around pretty lively by themselves, for nothing."

"I'll pay the truck man," he argued.

"Nothing doing. Bees prefer areoplaning."

"I'll pay you rent for 'em, too," he urged. "With all that money I'll have a bully stake."

"Providing the weather man permits," I amended. "Bees don't fly in wind or fog, and prune blossoms last only a week at the longest. Besides, there are 21,000 acres of prunes in Santa Clara county, and only 6500 colonies to do the pollinating!"

But those basic truths that I had hoped would act as ballast in my neighbor's flights, were cast overboard with the remark, "Some job for the bees! What *this* county needs is more colonies."

The sun's slanting rays had tinged the valley's gauzy robes with gold; a few belated bees were flying slowly hiveward; and still my neighbor soared. He was doing the sums all over again to include statistics on bee-pollination under possible adverse weather conditions.

Los Gatos, Calif.

April Beekeeping Problems in the North

BY L. V. FRANCE.

[The following summary of reports received and advice given to the beekeepers of Minnesota, by L. V. France, of the University Farm, will find practical application in most of our northern States during this month. This problem does not apply south of the 41st degree, except in very backward springs.—EDITOR.]

IN the Preliminary 1916 Beekeeping Survey of Minnesota, conducted by the University, Division of Bee Culture, reports gave information on the greatest April beekeeping problems. Bad weather, cold, rain, cloudy and windy, seemed to be the greatest evil, as 35.7 percent of the reports indicated. Twenty-five other reports named conditions that may be also directly influenced by bad weather, as to build up colonies; to keep them warm; to keep them strong; spring dwindling; to guard against sudden changes of temperature; lack of bloom until May, and inability to keep bees in the hives on sunny cold days. Seven reports considered proper windbreaks a spring problem; the brood gets cold and the queen stops laying. Over half, 56.0 percent, of the reports thus accuse bad weather as the greatest April beekeeping problem.

Food and feeding follow next in apparent importance, as eighteen or 11.4 percent of the reports indicated. Eleven of these reports were classified as "Lack of food"; six, "To keep bees supplied with stores," and one reports "Bees all right if honey lasts through April." Thirteen report 18.2 percent gave robbing as their greatest April problem. One answer tells its own story, "No April problems if I feed with narrow entrance." Lack of pollen was of sufficient importance as a spring problem to claim first attention in six reports, 3.8 percent. This lack of pollen probably is of more importance than indicated. "No April problems" is definitely reported by six parties.

Important miscellaneous and interesting questions follow: When to put on summer stands; queenless colonies; trying to handle bees in cold, damp weather; lack of knowing what to do in time; spring dwindling; rush of farm work causes bees to be neglected, and some die from robbing or starvation; many perish when searching for water; cover the hives to protect brood from chills; keep the hives sheltered; see that bees get water and pollen; no problems if fall feeding is adequate; old bees die too soon, etc.

WHAT SHALL I DO IN APRIL?

If the bees are all right in the cellar do not take them out until there is plenty of pollen, willow, soft maple, etc. Many bees are lost hunting for pollen when none is available close by. If the bees demand removal from the cellar before pollen is available, keep them busy carrying in rye flour from a warm nook in the edge of the bee-yard. In another nook, provide good clean water. Don't let them fly far away in the cold for water. Many perish on such trips. Contract entrances so only two or three bees can pass at a time.

Examine your bees the *first* warm day after removal from the cellar, and if they have not food enough to last until May 20, give them *at once* enough warm sugar syrup, or better, combs of honey saved from last year, to last till June 1. Don't be afraid to give a colony too much food; they won't dump it out of the hive or waste it.

To prevent robbing keep all entrances very small, and don't spill any sugar syrup or honey outside of any hive anywhere. If robber bees pounce into a hive when it is opened, close it immediately and wait three-quarters of an hour, or until the bees quiet down. If a very weak, worthless colony has begun to be robbed, remove everything from the hive but one comb containing *a little* honey, contract entrance to one bee space and let the robber bees gradually take it. Usually the little honey will be robbed out and the robbers will be satisfied. If the whole hive being robbed is removed, the robbers may attack in force the next adjacent colony.

Protect your bees from bad weather until about May 15 or 20, by wrapping each hive closely with several thicknesses of heavy wrapping or building paper or tar paper, leaving the entrance open. When bees are used to the protection afforded by the cellar from the cold and wind; they do not "build up" readily. Their "overcoats" are removed and the larger percent of the population, made up of already old bees, cannot withstand sudden temperature changes and spring winds and storms. If you cannot protect all of your colonies, *try it* on every other colony in your bee-yard. See if it pays in honey returns.

Queenless colonies should be united with good colonies by placing them above the good colonies with a thickness of newspaper between and protecting the entire two stories with paper. The second story may be removed in four or five days. Keep the colony protected. A small number of colonies, well cared for in the spring, will usually bring more honey returns with less work than a large number with little or no care.

April beekeeping problems will prob-

"THE PRUNES THAT MY BEES WOULD MAKE FOR HIM"
(Photo by John R. Douglass)

ably vanish if good laying queens and proper food are supplied in the fall, if the bees are wintered in a good cellar and have sufficient protection to May 20.

University Farm, St. Paul, Minn.

Honeybees and Spraying

BY T. J. TALBERT.

MANY fruit growers and beekeepers believe that fruit trees sprayed with arsenical poisons are apt to poison honeybees. Some farmers go so far as to make the statement that entire colonies of bees are destroyed by the poisonous sprays applied in the orchards during the summer.

Careful experiments and observations extending over a series of years have shown conclusively that if the spraying is done at the right time but little if any harm will be done to honeybees. The so-called calyx spray or the application made immediately after the blossoms fall is the one to which most injury is attributed.

The calyx spray should not be made until the petals or blossoms begin to fall. If the application is made earlier than this it is not an effective spray against the codling moth and apple scab, the two most important pests to be controlled at this time.

Before the blossoms fall the reproductive organs of the flower (stamens and pistil) fill and almost close the calyx cup, thus preventing the poison from reaching the place where the majority of the codling moth worms take their first meal. At this time the little green calyx lobes are turned down in such a way that it is very difficult to coat them with the spraying solution and consequently the small developing apples are not protected well against apple scab.

Spraying apple trees when they are in full bloom is also apt to prevent a satisfactory set of fruit. The spraying solution may be strong enough to burn and destroy the reproductive organs of the flowers.

By the time the petals begin to fall, when the spraying should begin, practically all the nectar has dried up and the bees are not visiting the flowers. No injury can therefore be done to the bees if the sprays are applied immediately after the petals fall.

The sprays made in the orchard have a repelling effect upon the bees. That is, the strong sulphur smell tends to drive the bees from the trees. The liquid is very distasteful to them. There are, therefore, many reasons for not spraying when the trees are in full bloom, while there is not a single good reason for spraying at the time when the spraying may be dangerous to honey bees.

Columbia, Mo.

[We consider it very important to use some repellent in the sprays, for even if the spraying be done after the bloom has fallen there is a possibility of some of it falling on blossoms beneath the trees and poisoning the bees in that manner. There need be no clash between the beekeepers and the horticulturists on this matter since the bees are necessary for the thorough fertilization of the bloom. Their interests are identical.—EDITOR.]

Beekeeping in Carniola

BY FRANK ROJINA.

NEARLY three years ago I left Carniola, a State in Austria of 3886 square miles, with 525,000 population, to study American beekeeping at the University State Farm, under the supervision of Prof. Francis Jager. Carniola is a country with mountains rising to a height of 12,000 feet, the sides of which are covered with fir and deciduous leaf-bearing trees. For over 300 years the inhabitants (Slovenes or Slavs) have given many thousands of colonies, honey and wax as payment for taxes. From that we can see how educated were our grandfathers, by steady work with the Carniolan bees. In 1769, Empress Maria Teresa, of Austria-Hungary, took up bee-culture and appointed a Carniolan, Anton Jansa, professor of beekeeping in Vienna, making an appropriation of $600 a year that he might spend his entire time with the bees.

Jansa lectured at the public gardens in Vienna, also traveling around as an extension man, giving methods of beekeeping as practiced in his native State. It was something new to the people of Vienna to see a Carniolan hive, as they were using only straw hives. The Vienna township had used his methods and hives only three years when the production of honey and wax in two months' time was valued at $10,500 as against $2000 or $3000 before.

Jansa, himself, when he started in 1770 had only 16 colonies, and in two years' time increased his apiary to 300 colonies. During this time he discovered parthenogenesis and what we call the McEvoy foulbrood treatment, writing many articles for publication of this discovery. Not until a long time afterwards did the professors and people of Vienna believe in him. He discovered the drone was the male bee, fertilizing the queen while on the wing, and also that an unfertilized queen is no better than an ordinary worker-bee, laying only drones, while the fertilized queen lays two kinds of eggs in all the cells, unfertilized in the drone-cells and the fertilized in the worker-cells.

Jansa published a book entitled "Swarming," which was of great benefit. Later, his second book, nearly completed at his death, was published by one of his students. It is entitled, "Complete Information on Beekeeping."

It is too bad that Anton Jansa is not known among the American beekeepers. The Austrian beekeepers call him the first and Dzierzon the second great man in bee history.

All the beekeepers in Carniola have bee-houses, about 60x20 feet, and about 12 feet high, built of logs with brick foundations, the home of their bees for summer and winter. For the winter months these houses are provided with curtains made of straw mats which roll down on the outside, making the bee-houses wind and snow proof. There is very little packing done inside the bee-house, which is kept at an even temperature of about 50 degrees.

The principal hives in use are the Carniolan, measuring about 1600 cubic inches, with movable frames. There are a few box-hives. Many improved hives are used for experiments. These are the Vienna, Bohemian, all kinds of German, and a few American hives.

The principal honey flowers are the red buckwheat, which gives nectar only in the morning; red, white, blue, and yellow clovers, basswood, dandelion, which gives only pollen, blueberries, wild and common chestnut, which produce very dark honey, and many others. A pure Carniolan colony with a young queen may harvest in a year from 200 to 300 pounds of honey.

The extracted honey is put into bottles, pails, and small barrels and is sold at an average of 30 cents a pound. Some is sold in the combs, but the extracted honey brings a better price as it is used a great deal in cooking.

MODEL OF HONEY LABEL USED BY CARNIOLAN BEEKEEPERS

Since the outbreak of the war, I hear from home that honey sells for $2.00 per pound. Clean wax is made into cakes selling at about 53 cents a pound and is used in making candles for the churches. A colony of bees sells for about $4.00.

The Carniolan bee is in color silver or light gray. It is a little larger than the Italian, and is very gentle. Carniolan bees are very prolific, are good honey gatherers, and do not propolize as much as other bees. They cap their honey clean and white and are good resisters against moths and disease.

Carniola has a Beekeepers' Association which meets yearly and there are many subordinate associations, one for each township, which meet every Saturday. There are about 900 members in the head association. All the advertising matter is published in their monthly magazine, "The Carniola Beekeeper," the editor of which is Francis Rojina, my father. The estimated number of colonies in Carniola for the year 1910, was over 53,000; in all Austria over 2,000,000, with a product of more than $9,000,000.

From earliest boyhood I watched and helped my father with his apiary of 500 colonies, and he took me on many of his lecture trips and to the National Bee Association meetings. The happiest days were those with father on his trips into the deep woods on the mountain sides where he visited and bought the purest Carniolan bees. The best queens were carried home in small cages that were strapped to our backs.

To me the Carniolan bees are the best. The only fault the American beekeepers have to find with them is their swarming, and this is caused by using too small hives. As soon as they are transferred to hives that can be enlarged, giving the queen room to satisfy her breeding capacity, she loses her inclination for swarming without losing her prolificness.

University Farm, St. Paul, Minn.

The Advantages of Full Sheets and Bottom Starters in Sections

BY G. C. GREINER.

MANY years ago, when the use of foundation in sections was becoming more and more general, and our more experienced beekeepers began to advocate its use as a means of insuring increased surplus yield, whereby the honey industry would be materially advanced, I could not see it in that light. I did not doubt that the yield of surplus could be increased by the liberal use of foundation, but I feared that its unrestricted use in sections, on account of its "backbone feature," would eventually have a detrimental effect on the honey market.

To produce a first-class article of table honey, I imagined bees had to manufacture it themselves from the start, and to retain my reputation of furnishing my customers the best that could be got I used foundation for many years very sparingly, not more than one-inch starters, or perhaps 1½ inches at the most. I do not remember the exact circumstances that impressed that idea upon my mind, but I think my experience during those early days, when comparing naturally built combs with those built on foundation, seemed to decide in favor of the former. At all events that notion, and from my present view point I can call it nothing else, has cost me tons of honey during the past decades.

As time passed on, super foundation, thin and extra thin, continued being advertised right along; our most prominent beekeepers advocated its use year after year, and as much as I watched the effects on the honey market, I did not hear of any serious harm being done by its use. On the contrary, its advantages of producing heavier yields became more and more recognized by the progressive beekeeper.

At last, having the success of others daily before my eyes, I decided to set aside my prejudice and adopt the use of foundation in sections as part of my management. But I still believed that the quality of honey would deteriorate in the same proportion as the amount of foundation increased. For a number of years I increased my one-inch starters to two inches, and as I could see no bad effects by the change, but thought I could notice a slight gain in the yield of surplus, I launched out on the use of full sheets in sections.

Since I have inaugurated my method of doubling the yield of surplus honey and control swarming, I am trying in every way to give my bees all possible advantage for uninterrupted super work. Full sheets in the sections are a great help; no beekeeper can afford to produce comb honey (or extracted, either) without them; but they do not go far enough. To make a complete job of our work, we must add bottom starters in all our sections. Under certain conditions they do not add materially to the yield, at least not so that it can be readily noticed, but they are the means of having all combs solidly attached to the bottom, and that has more to do with safe shipping than being attached to the sides.

Some of our beekeeping friends do not consider bottom starters of sufficient benefit to pay for the time and labor it requires to install them, but I consider them a paying investment. During the season of 1912, when I used them the first time systematically, I watched them very closely when the white clover flow began. After nearly all colonies had taken possession of their sections, I found one in particular where no bees could be seen from above. It being one of my better colonies, or as good as any, I was somewhat surprised at their backwardness, and to ascertain the cause, if possible, I drew out one of their center broad frames. I was still more surprised to find them as shown by Fig. 1 of the accompanying drawing. They had begun to work from the bottom starter upwards, and had reached about half way towards the top.

Examining frames from other supers, I found them in endless variations as indicated by Fig. 2; they were working from both ends of the sections at the same time. I cannot positively say that bottom starters alone made all this difference, but it indicates very forcibly that they are a great help to the comb-honey producer.

Later on, when I gathered up the last supers at and after the end of the honey flow, I found all sections, even the lightest, that had been supplied with bottom-starters, invariably like Fig. 3, while others, where for experimental purposes no bottom-starters had been provided, were like Fig. 4. If there were no gain in regard to heavier yield, the difference between Fig. 3 and Fig. 4 alone would amply pay the beekeeper for time and labor to install bottom-starters.

As an illustration of how easily we are led astray or deceived by wrong impressions, I will relate a little incident that transpired last summer.

When preparing my section supers for the campaign, I accidentally over looked inserting two sections into one of the broad frames. The space thus left was built out by the bees. Although there was no guide, from all appearance they did a model job, except that it was drone-comb. It being all natural, new comb, I expected that it would be far superior to the general grade of our section honey made on foundation, and to enjoy the treat, I reserved it for our own table. But imagine our surprise. Instead of finding a nice brittle article that would melt in the mouth, we found a tough sticky mess, every mouthful a fair sample of the toughest chewing gum taken from the penny-in-the-slot machine. It reminded me of our transferring days in the seventies, when we used to cut choice (?) pieces from veteran box-hives combs and considered them "delicious morsels."

This little episode removed the last vestige of the prejudice I still harbored and converted me into a thoroughly convinced full sheet and bottom-starter advocate.

La Salle, N. Y.

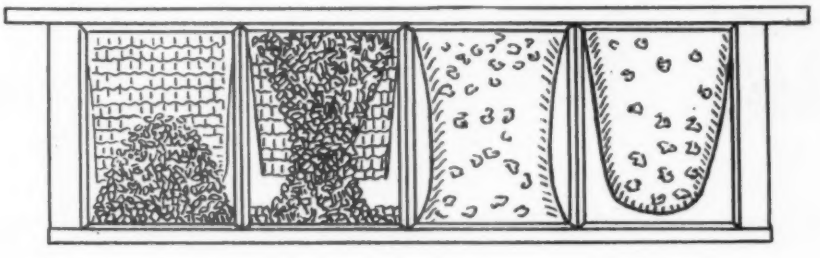


Fig. 1. Fig. 2. Fig. 3. Fig. 4.

MANNER IN WHICH BEES CLUSTER WHILE DRAWING OUT FOUNDATION IN SECTIONS

Points on Queen Mailing

BY GRANT ANDERSON.

IN the queen business the first point to consider is the rearing of good, well developed queens. It is not necessary to have them extra large to be well developed and vigorous. A queen that is not strong will not stand a long journey in the mails.

The second point to consider is the cage. Just any old thing will not do. If the distance is short the small Benton cage will answer the purpose very well, but if the distance is so great as to take several days to deliver the queens, a larger cage should be used.

Seventy-five percent of the queens that I mail go in the large six-hole cages. These six-hole cages are not export cages, but will deliver the queens

CAGES OF DIFFERENT SIZES FOR MAILING QUEENS

in any part of the United States, Canada, Cuba, and Jamaica. For export cages I have an eight-hole cage. The blocks are nearly 6 inches long, 2¼ inches wide and one inch deep. The holes are an inch in diameter. Two holes at each end are filled with candy and the bees occupy the four central holes. The queen and escorts are put in through a small hole in the side. After the screen is tacked on, a thin bar of wood is placed across the cage at each end and in the middle, and over these three bars is nailed a thin wood cover. The six-hole long distance cage as well as the three-hole cage has a groove in each edge the entire length of the cage; and a saw kerf from this groove into the queen compartment furnishes ventilation.

Next, but not last, is the candy. The success or failure of the delivery depends very much on the quality of the candy. This must be made of the best powered sugar and well ripened honey of good quality. Make a stiff dough of the candy and let it set several hours and then work it over again. If too thin, knead in more sugar, but don't make it too dry. No water is needed in the cages if the candy is made right. Never heat the candy in making.

Last, and very important, are the escort bees; for long distance or for export the escorts should be selected with great care; for short distance most any bees will do, but I prefer the young bees at all times. Young worker bees that have had a flight and are ready for the field will be best for escorts; old bees will be most likely to die in the cages and cause the loss of the queen. The number of bees for the escorts will have to be determined by the weather. If cool, use many; if warm, use few.

Rio Hondo, Tex.

Bee Hunting

IF we are to consider the hunting of bee-trees from the angle of profit alone, probably there is no room for an article on this subject in the columns of a bee-paper. But we must all have some sport or relaxation, and the old bee hunters tell us that there is nothing more fascinating than the hunting of such trees.

Very few sections are so thickly settled but that the reader may find one or more trees in the adjacent timbers by a careful search, while there are still localities where the trees are so numerous as to have considerable wild bee population.

THE USUAL OUTFIT.

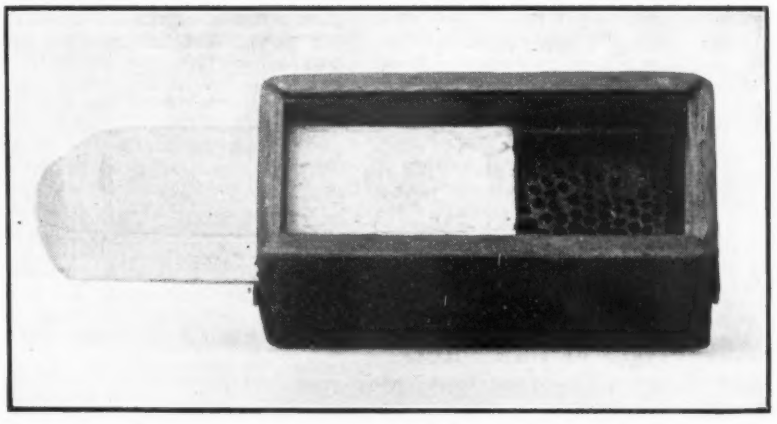
Bee-trees may be found by locating bees on flowers or at their watering places, and following them by "lining" to their home. The usual manner, however, is to be prepared with a bee-hunting box, a small piece of honey-comb, some anise oil, a little feed or bait (honey or sugar and water made thin enough to resemble nectar), a keen sense of observation and good eyesight.

THE BOX.

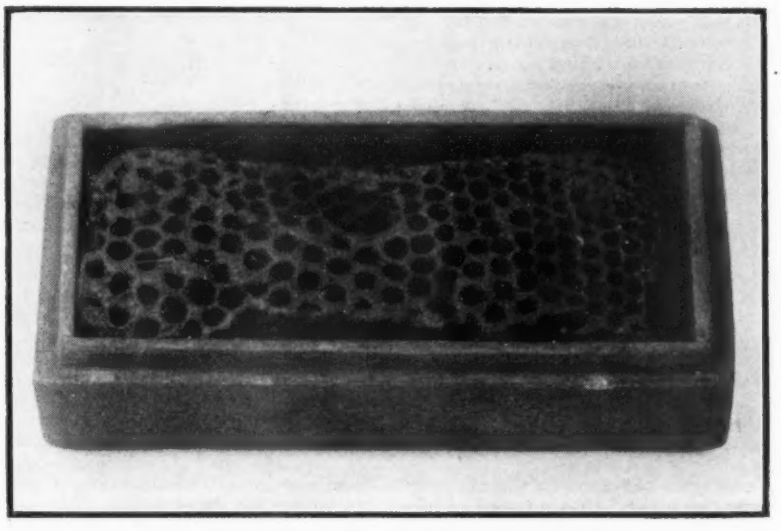
The one illustrated has been used by an old bee-hunter of Pennsylvania, W. H. McWilliams, who has located several hundred trees by the aid of it. It is an heirloom. The box is made in two parts; the lower part holds the comb with bait as in Fig. 1, and the upper part, fitting snugly over the lower, has on its lower edge grooves in which a cardboard is slid when desired, so that the bees may be separated from the bait below, or they may be caught in the upper box and then released to feed on the comb afterward. At the extreme top of the box is a glass, both to facilitate catching the bees on flowers and to give the hunter a means of observing the bees on the bait.

WHEN TO START AND HOW.

Naturally bees are not apt to "decoy" best when there is nectar in the field. Every beekeeper knows that during a honey flow bees will ignore honey spilled here and there on the hives. They prefer the nectar from the flowers. So, in hunting bees in the woods, choose a time of honey dearth if possible. Early spring is best if you are after the bees alone. Late summer



A BEE HUNTING BOX



BEE HUNTING BOX WITH BAIT EXPOSED

and fall should be chosen if you wish to get the honey and are not so particular about the bees. Choose a location, of course, at considerable distance from any apiary and near woods where bee-trees are most probable.

GETTING THE FIRST START.

If possible, a bee is caught who is seeking early pollen or getting a load of water at some watering hole. The glass lid is placed over her; she flies up against it, the box is put together and she is a captive. Many old bee-hunters if unable to find bees otherwise will decoy them by burning honey and old comb to attract them.

After the bee is caught, the box is made dark to induce her to take of the feed, and while she is feeding the cover is carefully removed so as not to frighten her.

GETTING THE LINE.

As soon as she is filled, the bee will take flight, going first in circles very similar to those of a young bee except that they are elliptical with a gradual trend in the direction of her home.

At the first flight, the direction may be hard to get, but the bee will not be long in returning with re-inforcements and a line will soon be established so that the direction will easily be recognized.

HOW FAR YOUR TREE IS.

Mark one of your bees with flour, crayon or paint on abdomen just before she leaves the bait for home. If she is gone seven or eight minutes, the tree is a mile away. Each additional mile will take from five to six minutes.

CHANGING LOCATION.

When the line of bees has been well established and the approximate distance ascertained, it is an easy matter for the bee-hunter to move in the direction of the tree, leaving a little of his bait at the original location to keep the line constant. Always keep on the winward side of the direct line when moving towards the tree, then in case you lose the line more bees can easily be attracted to the bait. If the line is well established and is kept going by frequent stops to bait more bees, it will in most instances be easy to locate the tree.

The bee-hunter, new at the game, will many times, however, move too far at a time and may go past the tree. This can readily be told by the lessening of the number of bees working on his bait box, and also by the fact that the few he does get will go in the opposite direction.

Sometimes it is found expedient to "cross line"; that is, to establish another line to the same tree, starting with a few bees carried away in the box to another location. In most instances, however, this need not be resorted to.

A WILD BEE CAVE ON DANCER MOUNTAIN AT LLANO, TEX.

BEE-KEEPING FOR WOMEN

Conducted by MISS EMMA M. WILSON, Marengo, Ill.

Putting Full Sheets in Frames

What is the best way, to put in full sheets of foundation to prevent them being torn down when a swarm is hived upon them?

Would you recommend painting them with wax?

I have had so much trouble this way that I rarely use full sheets, but hive swarms on starters and get too much drone-comb. HANNAH R. SEWALL.

Forest Glen, Md.

It would be easier to advise if particulars had been given as to the way the foundation had been fastened, and then just what trouble occurred. In the first place, foundation should never be given to a swarm without being well fastened in the frame. If fastened to the top-bar by means of saw-kerf and wedge, the wedge should not be lightly pushed in, but crowded in tightly its full depth. If rather light foundation be used, it may pull out even with the wedge in full depth. In that case the edge of the foundation that is pushed into the kerf may be doubled, or a thin strip of wood such as a piece of wooden separator may be crowded in beside the foundation. Instead of the kerf-and-wedge plan, the foundation may be fastened to the top-bar by means of melted wax (or rosin and wax, half and half), and some use the wax in addition to the wedge.

No matter how firmly fastened to the top-bar, no foundation will withstand a swarm without being supported by wires or foundation-splints, and these should be well imbedded into the foundation. If they be pressed in when too cold, the bees may try to gnaw them out. The work should be done in a warm room or on a warm day. Electricity is perhaps the best thing to heat the wire when embedding it, but you can get along without it. Having your frame wired and the foundation well fastened to the top-bar, turn the frame flat, wires down, and hold it over the burner of a gas or oil-stove. While holding the frame with one hand, press down with a finger of the other hand upon the foundation directly over the heat, moving the frame slowly the length of the wire, and letting the finger slide along on the foundation. The wire heats quickly, and melts its way in while the rest of the foundation is still cool. A little practice will teach you how slowly to move.

If all this is well done, there should be no trouble about foundation falling down. Still, in the middle of a swarm is a hot place where the foundation may break down, and you will do well to have the hive well ventilated for a few days, with the cover raised half an inch or more.

If you care to take the trouble, you can have the foundation fastened into the frame in advance. Give a frame of foundation to a colony, either in the brood-chamber or in the extracting super, at a time when honey is coming in well, and the bees will fasten the foundation so there will be no danger that a swarm will break it down. It may take a day, or it may take three days. Here is one way to have a full set fastened. Go to a strong colony, and put half the brood-combs into an upper story. Have the brood-combs of the two stories alternated with frames of foundation, and in two days, more or less, the foundation will be well fastened and may be taken away. Of course, this cannot be done in a cool time, lest the brood be chilled.

Some succeed well by painting with wax the upper part of sheet.

May Disease

Last spring I sent to New York for a colony of bees, and they arrived on April 17, in what I thought was good condition. In May I was compelled to

move them 1½ miles. The weather was cool, and as the distance was short I put on an empty super and closed the entrance. However, there were quite a few bees dead when I released them, although they were not confined longer than an hour. Shortly after that they seemed to have a sort of May disease; they looked greasy and had large abdomens. I lost about half of the colony, but the disease finally disappeared. They were late in swarming, and as my queen was clipped, I intended to let the bees swarm but once. I hived the swarm in a new hive on the old stand, placing the old hive close beside it, thinking to move it in seven days to a new stand.

Swarm No. 1 came out on Thursday afternoon, and on Saturday morning swarm No. 2 came out. I hived this swarm in a new hive and placed the old hive back. The same hive had a third swarm three days later, but this time I cut out all queen-cells and returned the swarm with the virgin queen to the parent hive. They did all right for a while, then one morning I saw swarm No. 2 was excited about something. After a search I found their queen under the alighting-board which was slightly raised at one end. She appeared cold, and after warming her up she seemed spry again, but refused to enter the hive, although the bees were willing to accept her. I gave her some smoke and she went in, but soon came out again and wandered off on the gound, so I killed her and united swarms No. 1 and No. 2.

On Aug. 18 I moved to Mukwonago, and had to move the bees, and as they had their brood-chamber filled with brood and honey, I thought I would have bad luck in moving. I have the Langstroth hives, and took off the cover and bee-board, leaving an empty super over the brood-chamber, closed the entrance with a screen and tied cheese-cloth over the super. We loaded them and started off at 3:00 o'clock in the morning, getting there by 5:00. We released them at once after giving them a little smoke, and we did not lose a bee nor a drop of honey.

Number 1 and 2 stored about 25 pounds of honey in the super and raised an immense swarm of bees. The old colony did not store any and they are lighter in bees than the other hives, and before cellaring them I noticed some of the bees had a greasy look and quite a few died, and now in the cellar they have died off twice as much as the other colonies.

1. Why did the afterswarm come out so soon after the prime swarm?

2. Do you think it is bee-paralysis my bees have, and will it again appear in the spring? Is it a disease that is in the hive, and should the old hive be destroyed?

3. Does an old queen rear larger swarms than a young one?

4. Do you think my bees were lazy or sick that they did not work? There were lots of sweet clover, goldenrod and dandelions to gather from. Will they do better next summer?

5. Should I requeen or should I unite the two swarms in the hive with the old queen? The young queen has nice bees, all 3-banded and of good color. Do you think it would pay me to try her again, the old queen was a tested Italian? [Mrs.] C. White.

Mukwonago, Wis.

1. It is possible that when No. 1 was ready to swarm the weather was too bad, being cold and rainy, and this continued until the swarm came out about six days later than it could have done if the weather had been good, making it only two days longer until the first virgin was ready to go with the second swarm. A delay of that kind often happens, but it is rare that the delay is so long. So rare that another explanation is probable. The first swarm occurred on Thursday. On Wednesday or Thursday of the preceding week, it may be that a swarm, unnoticed by you, issued, and that the old queen was unable to go with the swarm, or was in some way lost, and the swarm returned. Then when the oldest virgin was ready, the swarm which you saw issued, and two days later the second of the young queens issued with another swarm.

2. As you describe it, it is pretty sure to be paralysis. It may appear again, but likely not. The hive is all right.

3. If you mean does a 2-year old queen have a larger swarm than a 1-year old queen, no. If you mean does the old queen that issues with the prime swarm have a larger swarm than the young queen that issues with the second swarm, yes.

4. Hard to tell. Possibly both. If there is no paralysis this year, they are likely to do better, provided it is a good year.

5. It would hardly be advisable to unite the two colonies. As the swarm was late the young queen didn't have the best chance, and may do better this year.

Miscellaneous News Items

Prune Pollination.—Bulletin No. 274, of the California Agricultural Experiment Station has for its title, "The Common Honeybee as an Agent in Prune Pollination." It is written by A. H. Hendrickson.

It appears that insects are extremely scarce in the Santa Clara Valley at the time that the prune trees are in bloom, with the result that the crop is not so large as it might otherwise be.

Experiments were conducted with trees entirely protected from bees and other insects by netting, and with others having adjacent to them plenty of honeybees. The results were as usual; the bees' proximity resulted in a much larger set of prunes, especially with the French variety.

The best results will probably be obtained by bringing in bees from outside and scattering them about the orchard with at least one colony to each acre.

Nougat.—Three cups of granulated sugar, 1½ cups of any kind of nut meats (preferably English walnuts), ⅔ cup of honey, ⅔ cup of hot water, and the white of one egg beaten stiff.

Boil the sugar, honey and water together until they make a rather hard ball when dropped in cold water. Remove from the fire, pour in the beaten white of the egg and beat briskly with a silver fork. After beating a while, pour in the nut meats and continue to beat until it begins to make a hard creamy mass, then pour into a buttered

L. B. SMITH, OF TEXAS, GOT HIS START IN BEEKEEPING BY HUNTING BEE-TREES

in or platter to cool.

No better, more wholesome or delicately flavored candy is obtainable at any price. Try it.

OREL L. HERSHISER.

The 47th Annual Convention of the National.—The National Beekeepers' Association was held in Madison, Wis., Feb. 6, 7 and 8. Owing to a severe storm and blockade north and east, very few members were present, about 70 in all.

The program opened in the afternoon on Tuesday with a "rouser" by N. E. France, in his address of welcome. President Francis Jager followed with the annual address. In the past year the National has obtained an appropriation (from the government) of $5000, for educational and extension work, and has obliterated the factional lines, thus paving way for future work. The future work should be on a broad scale, embracing all big activities of the National in separate sections under able chairmanship.

Doctor L. D. Leonard, of Minneapolis, Minn., spoke on the "Forks in the Road," metaphorically describing the wanderings of the National. He advised for future travel to organize three sections, the educational, the industrial and the legislative, with more to come as need arises.

The big discussion of the day followed an address by Dr. S. A. Jones, of the Bureau of Crop Estimates of Washington, D. C. Doctor Jones absolutely proved the correctness of the government honey crop estimates. To give a widespread benefit to beekeepers of the country, he remained another day to confer with a committee on a plan of cooperation between the National and the government office. The result of this conference was that henceforth the retail and wholesale price of comb and extracted honey will be asked and given out by the government to those who send in reports and to the officers of the National who will thus be able within a fraction to determine what the *real* price of honey ought to be at retail and wholesale.

Prof. Taylor, of the University of Wisconsin in Government office, spoke on accounting and cost and profit. The National has appointed a committee to cooperate with Prof. Taylor and the Government office of Accounting in order to get up a system of bee bookkeeping for larger producers. The National will probably be able to furnish this business book to its members free of charge as soon as completed.

None of the speakers for Wednesday were present. Dr. E. F. Phillips took up his paper on State and Government Aid in Educational and Research work. He first pointed out the necessity of such work, not in making more beekeepers, but better ones of those existing, calling attention to gross ignorance of bees and beekeeping methods even among the biggest men in the industry. "Some one suggested just now", he said "that there are among the members of the National some who do not know how to hive a prime swarm." The plan of the Government is to extend education to every State in the Union. North Carolina and Tennessee received one educator each last year on behalf of the National Beekeepers' Association, and the work these men are doing is as wonderful as the appreciation and cooperation of the people of these two States.

A lively discussion followed, and when the atmosphere cleared this was the result:

1. That the National go on record favoring further extension of educational and research work.

2. That this section of the activities of the National be put into a special section with a secretary in charge under the executive committee.

Dr. E. F. Phillips, of Washington, D. C., was chosen to act as secretary of this educational section.

A pleasant divergence was the banquet or dinner held at 12, noon, at Park Hotel. Sixty-two were present. Prof. Francis Jager acted as toast-master, and about a dozen good and funny talks were given, mostly by members from other States.

At 3 p.m., Colorado had its inning. Mr. Wesley Foster, of Boulder, Colo., spoke on Cooperation in Distribution of Honey, also on Imports and Exports, and Mr. H. Rauchfuss, of Denver, on the Colorado system of handling honey. Both papers were enthusiastially received, showing that the industrial part of the bee is nowadays uppermost in the people's mind. After a long debate and discussion a special section of the National was organized under the name of industrial section, with Mr. H. Polhemus, of Colorado, as secretary, to study national methods of cooperation and report next year. Mr. Frank C. Pellett, of Atlantic, Iowa, was appointed secretary of the legislative section.

Mr. C. P. Dadant spoke on State Fair and exhibits, but he widened out into a general boost for progress, which, from a man of his standing, will be a great asset for the National. Thanks

After supper the question of the National Central office was discussed by Prof. Eric F. Millen, of Ames, Iowa. The paper was so interesting that a discussion followed, after which the five points brought out by Mr. Millen, were unanimously adopted.

Hamlin B. Miller, of Marshalltown, Iowa, closed the program at 9:30 p.m., and if anybody was drowsy by that time they were soon wide awake and stayed wide awake whilst he spilled his "Pep" on "How to increase the membership of the National."

At the business session Thursday morning a resolution to stand by President Wilson was adopted and wired to Washington.

Other resolutions adopted, were, to refer the great questions brought up at this meeting to committees to work them out and report at the next meeting;

To print our own convention report as well as any other reports during the year and send it to members;

To procure money for such printing by every member present pledging himself to secure five new members for the National;

To appoint in the most promising States a representative or secretary to take care of the interests of the National in that State. The president was authorized to appoint such men.

The nominating committee consisting of Messrs. C. P. Dadant, E. F. Phillips, and Wesley Foster, reported that they recommend as officers for the next year Prof. Francis Jager, of Minnesota, for President; Mr. J. Bull, of Illinois, for Secretary, and H. Polhemus, of Colorado for Vice-president. They were elected by acclamation, whereupon the meeting adjourned.

The meeting was permeated from beginning to the end by a spirit of enencouragement, hope and good cheer, characteristically expressed in a message received from Dr. C. C. Miller.

FRANCIS JAGER, *Pres.*

John Vandervort, whose death was announced in our March number, was born in Schoharie county, N. Y., Jan. 6, 1832, and at the age of 12 years, with his parents, went to live at Laceyville, Pa. He remained in the family home until 1853, when he was united in marriage with Miss Harriet Montgomery, of Silvara, a year later going to Marengo, Ill., where he spent about 15 years.

In 1869, Mr. Vandervort returned East, locating in Binghamton, and three years later permanently settled in Laceyville. At this time he formed a partnership with his son A. L., going into the planing mill business for the manufacture of beehives, the son taking charge of the milling end while the father devoted his time to bees, which in the following years proved a very successful venture. The partnership of

THE LATE J. VANDERVORT

father and son continued about three years, and in the dissolution the son took the milling business while the bee industry was continued by the father.

While in Binghamton, Mr. Vandervort was for a time in partnership with Jones, who "pays the freight."

Mr. Vandervort was the first manufacturer of comb-foundation cylinders to make mills of different cell walls for the different grades of foundation. The first machines made by Washburne under the direction and management of A. I. Root, were very accurate, but no attempt was made by him at first to make cell walls of different depth and thickness, or at least only one grade was put on the market. Mrs. Frances Dunham, of Depere, Wis., about 1880,

put upon the market mills with a rounded cell which gave very satisfactory foundation. But this was a very heavy grade, as it was difficult to manufacture anything lighter than five square feet to the pound with her mills. Vandervort, who was a fine machinist, at the suggestion of the writer made mills with walls of different thicknesses and different depths. It was with his mills that the first separate grades of brood and super foundation were secured.

Vandervort was as warm hearted and generous as he was skilled in his profession. We used his mills for years, and I visited him in 1884, to suggest some improvements in his methods. He had a little shop about 12 by 12 feet, and in the midst of his skilled work, which required a great deal of attention, he would find occasion to help his neighbors. I remember his stopping from his work on a mill to repair a tool for a neighbor blacksmith, free of charge. He cared little for money, and I have before my eyes a letter from him, dated Sept. 2, 1884, in which he writes: "You sent me nearly $50 more than belongs to me, and for this I shall try to get even with you some future day." We never could get him to send us a bill for the numerous mills that he manufactured or repaired for us, and one of his favorite sayings was: "What a grand country America would be if it would only forget the Almighty Dollar."

Mr. Vandervort was thrice married, and of the first marriage in 1853, there survive two children, Mrs. Carrie Darrow, of Reading, Pa., and A. L. Vandervort, of Laceyville. In June, 1875, he was married to Emily Jane Fish, of Silvara, and of this union there survives one daughter, Mrs. Frank Creasy, of Berwick, Pa., and in 1890 he was united in marriage to Mrs. Ella Brown, of Golden Hill, who also survives.

Rhode Island Association.—The Rhode Island beekeepers organized a society at Providence Feb. 21. The outlook ahead seems very encouraging in power of members. The society is to meet frequently, place of meeting will probably be the Lecture Room of the Providence Public Library.

It is the intention of the society that any one interested in beekeeping shall not be overlooked. This is the only society in the State, and any one interested is cordially invited to become a member. Communicate with the President, Arthur C. Miller at the Providence Institution for Savings or the Secretary, Gardner B. Willis at the Providence Technical High School.

GARDNER B. WILLIS, *Sec.*

DR. MILLER'S ANSWERS

Send Questions either to the office of the American Bee Journal or direct to
DR. C. C. MILLER, MARENGO, ILL.
He does NOT answer bee-keeping questions by mail.

Putting Dummies Between Brood Combs

1. I am getting to think that old brood-comb is much of an abomination and should unconcernedly be turned into wax. In order then to make good what is thus lost, what ways are there co-incident with regular honey production and with minimum sacrifice thereof, to get full foundation in brood-frames drawn out in maximum quantity so far as aforesaid not detrimental to honey production?

2. I am an opponent of the divisible brood-chamber; yet it seems that some offer a superior way for contraction, and thus sending bees up into the sections by confining the bees to one part of the brood-chamber. How can one approach this nearest when using 10-frame full depth Langstroth hives? Of course, by using dummies. Now according to Dadant, bees neglect sections that are not over frames. What would then be the best arrangement of frames of brood and dummies in such 10-frame hive, if there were therein four or five dummies per hive?

PENNSYLVANIA.

ANSWERS.—1. The best scheme for getting combs drawn out depends somewhat on circumstances. With natural swarming, or even with shake-swarming, probably the best time is to give the frames of foundation at the time of hiving or shaking the swarm. In other cases a good way is to have combs drawn out in a super.

There may be some peculiarity in your case that makes old combs objectionable, but did you never notice that when bees are given their choice they prefer old combs to new? I have been keeping bees more than half a century, and I've never yet turned down a comb because of old age.

2. The Dadant opinion is entirely correct. Put four or five dummies in one side of the brood-chamber, and the sections over the brood will be finished while the outside sections over the dummies will be hardly touched. Well, is there any other way but to put the dummies between the brood-combs? Had thought of that, hadn't you? but you thought it would hinder the queen from going from one frame to another. Well, it won't, for I have tried it. It might, if you should put the dummies in a bunch in the middle of the hive, but scatter them, with only one in a place, and it doesn't seem to hinder the queen from keeping all combs occupied. For all that, I don't believe you could coax me to try to limit the queen's room in that way.

Putting Up a Hive

Last spring I bought a lot of hives which were shipped to me knocked down. I put them together, and among the lot, for each hive, was a board ¾ inch thick, and as long and wide as the hive. This board has a hole in the center 3¾ inches long and 1¼ inch wide. The question is, where does this board fit in? Does it go on top of the brood-hive under the super or on top before the metal top is put on?

ILLINOIS.

ANSWER.—It goes on top of the brood-chamber, under the super (when there is a super on). The slotted hole may take a Porter bee-escape, and it may also serve to put a feeder over. Don't use that board during the honey crop.

Miscellaneous Questions

1. In working for comb honey, is it essential to use excluders to keep the queen from laying in the super?

2. How many colonies of bees are there in Illinois? In Canada?

3. Is it necessary to put bees in the cellar or use winter packing cases in this locality?

4. Is it essential to provide shade for bees to prevent their swarming and leaving the hives?

5. Which is better for the production of comb honey, the 8-frame hive or the 10-frame?

6. From an article in the Canadian Horticulturist and Beekeeper for July, [illegible] headed, "Beekeeping in Holland," I infer that straw skeps were used in place of the modern movable-frame hive. Has the movable frame hive ever been introduced there and disliked, or is it unknown?

7. I bought two colonies of 3-banded Italians in July, 1916. A neighbor did the same, and bought bees from the same apiary. His made a super of honey and enough stores to last them through the winter. Mine made only enough to last them through the winter. From careful watching I ascertained that mine flew in large circles about the apiary gathering very little honey when a field of white clover in full bloom was within a hundred yards. What was the matter with them?

8. What is the best method to entice bees from a hollow tree or log into hives?

9. How cold does it have to get to kill bees in winter housed in 8-frame hives with no packing cases and in the open?

10. Which method is the better in a queen-rearing apiary, the Ben G. Davis plan or J. M. Davis plan?

11. Which is the sweetest, honey, molasses or sugar?

ILLINOIS.

ANSWERS.—1. I don't use excluders under sections, as I think they are generally used. But I have sections filled with worker foundation. If you use small starters in sections it may pay you to use excluders; otherwise the queen will go up to lay in the drone-comb; the bees are sure to build in sections when only starters are present.

2. I don't know.

3. You are in latitude about 39 degrees, and will do better to winter outside.

4. It is not essential, but better for the bees, and better still for the beekeeper.

5. All things considered, the larger hive is better.

6. Holland, I think, is like some other European countries, where some use movable-comb hives, but a good many have not yet advanced so far, same as in some parts of our own country. I don't think there is a country in the world where movable combs have been rejected after fair trial.

7. One colony may have been stronger than the others, or the bees may have been better. Possibly the management may not have been the same. If the bees got nothing from the white clover, it was no doubt because the clover yielded no nectar. That happens a good many times.

8. I don't know of any way to entice them out. They must be forced out by means of smoke, carbolic acid, etc., or the tree felled and cut open.

9. That depends on many things. A colony weak enough may succumb to a temperature above freezing, if that temperature be long enough A colony strong enough, with stores enough, will defy the mercury to get low enough to kill it.

10. Like enough the Ben G. Davis plan is better for the son, and the J. M. Davis plan for the father.

11. If you touch your tongue to each of them in succession, you will probably say honey is the sweetest. But I have never been able to find out for certain which of them would go the farthest in sweetening, say a batch of dough, although I have tried to do so.

Checking Swarming

In "Fifty Years Among the Bees" you advise, before the bees become crowded in the spring, to place a brood-chamber with empty combs under the colony to check swarming, etc. How would the plan work to substitute full sheets of foundation for empty combs?

PENNSYLVANIA.

ANSWER.—Foundation will do well. After one has been in the business some time, however, there will generally be drawn combs on hand, and they will keep better to be in the care of the bees

Weight of Sections—Foulbrood—Size of Hive

1. What should a section of honey weigh some say from 10 to 13 ounces for a pound?
2. How can you tell when bees have foulbrood? What time of the year do they get it and how can it be cured?
3. Would a hive 17 inches long and 12 inches wide be large enough for an average colony?

IOWA.

ANSWERS.—1. The Colorado rules require a section of fancy honey to weigh, with the wood, 13½ ounces; No. 1, 12 ounces, and No. 2, 11 ounces.

2. Write to Dr. E. F. Phillips, Department of Agriculture, Washington, D. C, and he will send you a number of pages that will give you full information.

3. That is a little smaller than the 8-frame Langstroth, which is generally considered hardly large enough.

Flowers for Pollen

What varieties of garden flowers are best suited to furnish pollen and nectar for bees?

OKLAHOMA.

ANSWER.—Mignonnette and sweet alyssum are good, but unless you plant by the acre it will not amount to much.

Swarming—Requeening

1. Will cutting out the queen-cells in the brood-chamber about every ten days during the summer prevent swarming and induce the bees to make more honey?
2. My bees are a cross between the black and yellow species. They are not very good workers, and the swarms that issue are small. I wish to change to pure Italians. Do you advise the pound package of bees or requeening with Italian queens? Would the young queens be pure Italian?

QUEBEC, CANADA.

ANSWERS.—1 Killing queen-cells every ten days will delay swarming, at least for a time; in some cases it will prevent it altogether; but generally the colony will swarm sooner or later in spite of cell-killing.

2. The result will be the same whether you get a queen in a queen-cage or in a pound package, only with the queen-cage you run the risk of introducing. The young queens you rear from your new stock will be pure if they meet pure drones, otherwise not.

Increase—Swarm Prevention—Superseding

1. I have now four colonies which I hope to carry over winter. I would like to increase these to eight, preferably by the shaken swarm plan, but I am at a loss to know how to treat the old colony so that they will rear a good queen from the cells that were started before the shaking was done. But suppose they do not get the swarming fever, what then? Wouldn't it do just as well to divide the colonies sometime in May, following the plan you gave to "Pennsylvania," in answer to question No. 3, page 245 of the American Bee Journal for July, 1916?
2. If I follow this plan, will that end the swarming for the year? Will they gather as much surplus as if they had been shaken instead of divided? I might watch and wait for signs of swarming until it was too late to make the increase by division.
3. If I increase by shaking, wouldn't there be a good queen reared in the old colony if I do not shake clean, but leave some of the bees on the frames?
4. My bees are in the country six miles from here, and I do not see them every day. I had but one colony last year, and this colony swarmed about the middle of May, when there was no one there to hive the swarm, and it got away. I did not know this until about four days after the swarm came out. Not knowing what to do then to prevent any afterwarms, I let matters take their own course, with the result that there were more swarms when I was not there, and all left for the woods. In spite of this I got about 40 pounds of fine honey from this colony, mostly in shallow extracting frames. What would have been the proper course to pursue in order to prevent any afterwarms, when I got there about four days after the first swarm issued?
5. How do you tell when the bees are gathering honey, and when the flow ceases? It is easy with pollen but not with honey.
6. I bought two colonies last summer, and I find that some of the brood-frames are not wired. Two of the combs fell out of the frames while looking over them. I would like to replace these frames with others that are not wired. When would be the best time to do this so as not to interfere with brood-rearing? I will have to use new frames with full sheets of foundation, as I have no drawn combs.
7. How can I tell, when queen-cells are found in a hive, whether there is to be swarming or superseding?
8. If, when superseding, the bees build more than one queen-cell is there any danger of swarming?
9. I sometimes find turban-shaped enlargements of cells in the hives. Are these the beginning of queen-cells or an indication that the bees are in a swarming humor?
10. I always thought that the longer a colony was without a queen the more readily they would accept one when introduced, but after reading that editorial, "The Meanest Colony," etc., on the first page of Gleanings for July 1, 1916, I am all at sea. If I should find any of mine queenless at any time I wouldn't know what to do.
11. I can buy some 8-frame hives with supers for $1.00 each, all in good condition. Would you advise doing this or would it be better to get new *10-frame hives* at about $5.00 each?
12. If I give a queenless colony a frame of brood with larva less than three days old and they start several queen-cells, will there be any swarming, or will the first queen out destroy the other cells?
13. What will happen to a colony that has a laying worker in the fall and is left in that condition until spring?
14. How can I, as advised, use the strongest colonies or those that swarm the least, for the crop, and at the same time breed from them, so as to build up all around.

PENNSYLVANIA.

ANSWERS.—1. It will be all right *provided* the colony is strong enough in May. If not very strong then, wait until June.

2. You cannot reply upon it for an absolute certainty, but the likelihood is that there will be no swarming. It isn't necessary to wait for signs of swarming; sometimes a strong colony goes through the whole season without offering to swarm. The important thing to watch for is the proper strength.

3. When you shake and put the brood in a new hive *on a new stand*, even if you leave quite a force of bees on the combs, there will be no field bees coming into the hive for two or three or more days, hence no honey coming in, and the bees will be in a discouraged condition, in no mood to rear a good queen. You can, however, take the queen away with two frames of brood and adhering bees, putting her on a new stand, then a week later shake your swarm, leaving nearly all the bees with the queen on the old stand, and on the new stand (where the queen has been during the previous week) all the brood but one. But instead of shaking off the bees you must brush them off the combs, for the shaking would ruin the queen-cells. However, it will be all right if you leave at least one frame without shaking, provided it contains one or more good cells.

4. If the queen had whole wings, and the swarm absconded with her, and you got there four days later, you might at that time kill all cells but one. You might also, on that fourth day after swarming, take all but two frames of brood with adhering bees, and put them in a new hive on a new stand, beside the old one. Then a week later, when there would no longer be any young queens left in the cells (they would have emerged or else been killed) you would return to the old hive all the brood and bees you had taken away.

5. It is hard to say for certain whether a given colony is gathering or not at a given time. But there are some things by which you may make a pretty good guess. When honey is yielding abundantly, you will see the bees flying in and darting out of the hives like mad, appearing in the greatest haste. They are likely to be much crosser when no honey is coming in. One of the best signs that the flow has ceased is to find the bees suddenly become very cross. They will also be more listless about flying in and out of the hives.

6. Notwithstanding the apparent incongruity, the best time is when the bees are most busily engaged at brood-rearing.

7. You cannot be sure about it. If you find a dozen or so of cells at a time when bees generally swarm, you may be pretty sure that the bees have thought of swarming. If you find not more than three or four after swarming is mostly over, you may guess that supersedure is intended.

8. Yes, an increased flow of honey or something else may induce the bees to swarm when otherwise there would have been superseding. Conversely, a check in the honey flow, or something else, may turn the bees from swarming to superseding.

9. They are the beginnings of queen-cells, called cell-cups; but may be found in the hive almost any time of year, having no reference to swarming.

10. Do just the same as you would have done if you never had seen that editorial, only now you know that when bees are queenless a long time they become somewhat reconciled to their queenless condition and resent the intrusion of foreign royalty. So when you find a colony queenless, generally you will move just as soon as you can to supply the deficiency.

11. All depends upon the relative value you place upon working with the two kinds, and what is to be your future course. If you intend to continue using the smaller hives, by all means take advantage of the offer at $1.00. If you expect afterward to use the larger hive, it might hardly be worth while to take the smaller as a gift.

12. That depends. If it is swarming time, and the colony strong, you may expect swarming; otherwise not.

13. The bees may be all dead by spring; if not, there will be a few of them, and it would be better if they were all dead. Only when you say *a* laying worker, you should understand that a large number of laying workers are likely to be present.

14. I am a bit puzzled to know when you were advised to use your very best queens, *always*, for the crop. When a queen has established her reputation for superiority in any given year, it's a good plan the years after that to keep her in a nucleus, so as to let her live as long as possible, without expecting her bees to help on the surplus. However, it's no trick at all to keep her in a strong colony, working its best on the harvest, and at the same time to breed from her. All you need to do is to take from her a small amount of very young brood, to be used in rearing queens in other strong colonies made queenless for a time.

To Incite Swarming

My bees do not swarm until after the commencement of the honey flow, which commences about July 10. Could I in any way cause them to swarm before that time. Here we have very little fruit bloom and some dandelions. If I can cause them to swarm before the honey flow I can get much more honey. I run for comb honey. NEBRASKA.

ANSWER.—If there is at any time a dearth of a week or more, when there is no pasturage for the bees, you might feed during that time. You might also get some of the colonies to swarm earlier by giving them sealed brood or bees from other colonies. Of course you can have recourse to artificial increase by any of the methods given in your bee-books. I am somewhat skeptical as to your getting more honey by having swarming earlier.

Bees Poisoned from Spraying

1. What size of mesh should a wire-screen be to prevent bees from feeding through it?
2. Does poison such as bees get from the sprays in orchards kill them if they carry it, or must they eat it to affect them?
3. Do working bees eat nectar or honey from the hive?
4. What time of day do they eat when there is a good flow on?
5. I would like to keep six or eight colonies in a district where there are orchards. I kept a number last summer, but the fruit spray poisoned them. Is there any way to work them so the spray will not kill them, or so they will not carry the spray? The spray is on at two different times of about three days each. I don't care to shut them up. Would they continue to go to the fruit bloom if each colony was divided into nuclei and each nucleus was fed with a stimulative feeder? WASHINGTON.

ANSWERS.—1. I don't know that screen is made with so fine a mesh that bees on one side cannot reach through to feed bees on the other side. To prevent that you can have two screens one-fourth inch or more apart.

2. I am not sure, but I suppose taking the poisoned liquid into their honey-sacs is enough to kill them.

3. Both, I think.

4. I suppose at any or all times.

5. I don't believe feeding in nuclei would prevent the bees from getting the poisoned spray.

Bees Resisting Foulbrood

1. A year or so ago J. L. Byer made the statement that a young vigorous pure-blooded Italian queen was immune from the contagion of European foulbrood. What is meant by an immune Italian queen? Are we to understand that the pure blood of the queen overcomes the germs of the disease by the law of phagocytosis?
2. If a colony of bees becomes infected with European foulbrood and the queen is caged for ten days, or a young vigorous queen is introduced at the end of ten days, and the disease disappears, in what manner or under what law would the disease be eliminated? Would it be by the police force of the bees made vigorous by being made queenless?
3. If a colony of bees die from foulbrood and the fixtures and dead bees removed, and a colony of bees, honey and brood in all stages absolutely pure placed in this diseased hive and the disease appeared again, in what way would the germs enter the larval bee?
4. Can a foulbrood germ come into existence in any other way only through the larval bee?
5. Why do good men say their bees are so vigorous and strong that they resist the foulbrood germs, and do not tell in what way they do it? PENNSYLVANIA.

ANSWERS.—1. I suppose that by an immune Italian queen is meant a queen whose progeny is immune to European foulbrood, that is, would not contract the disease; but I never saw it claimed that phagocytosis had anything to do with it.

2. I don't think any one has claimed that the colony has become more vigorous by queenlessness. I don't know that any theory has been advanced to explain how the cure takes place through queenlessness, except the one advanced by myself. Since no one to my knowledge has objected to it, and since no other theory has been advanced, it is possible that my theory may be correct. The theory is this: It is well known that when a larva is crushed, the bees promptly lick up the juices of the crushed larva. When a larva is affected by European foulbrood in a short time it dies, and then the workers will suck its juices, and then when they feed other larvæ the disease will be conveyed. But that's only for a short time; as soon as the dead larvæ becomes decayed and unpalatable, the nurses will have none of it. Suppose now the queen be caged, killed, or removed. In about eight days all the brood will be sealed, and there will no longer be any chance for the nurses to eat diseased juices. Indeed, they will probably have ceased before that time, for the diseased larvæ will be mostly so far decayed that they are not to the taste of the worker. Then let egg-laying begin again in the hive. It will be three days before there are any larvæ to be fed. By that time the nurses will have nothing but wholesome food for the babies, and generally the disease will not again appear. Plenty of the disease in the hive, but not in condition for the nurses to consume it, and so it is not fed.

This theory may serve until some one proposes a better one. At any rate it works out all right in actual practice, that's the important thing.

3. Under the circumstances you mention I should not expect the disease to appear at all. But if it did it would be by the germs being fed to the larvæ.

4. In the hive, no; although scientists may rear the bacilli from the spores with any larvæ.

5. I don't know why they don't tell; possibly they don't know, and possibly they don't think it very important to understand any farther than to know how to get rid of the disease. As to immunity from the disease because of vigorous bees, I have doubts as to there being any bees that are entirely immune; but a vigorous colony will do better work at cleaning out the diseased dead brood than will a weak colony.

Classified Department

[Advertisements in this department will be inserted at 15 cents per line, with no discounts of any kind. Notices here cannot be less than two lines. If wanted in this department, you must say so when ordering.

BEES AND QUEENS.

PHELPS' Golden Italian Queens will please you.

FULMER'S Gray Caucasian queens are winners; also by frame and pound.

BEES AND QUEENS from my New Jersey apiary. J. H. M. Cook,
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TRY ALEXANDER'S Italian queens for results. Untested, each, 75c; 6 for $4.25; $8.00 per dozen. C. F. Alexander, Campbell, Cal.

PLACE your order early to insure prompt service. Tested, $1.25; untested, $1.00. Italians and Goldens. John W. Pharr, Berclair, Tex.

PHELPS' Golden Italian Bees are hustlers

VIGOROUS prolific Italian queens $1.00; 6, $5.00, June 1st. My circular gives best methods of introduction. A. V. Small,
2303 Agency Road, St. Joseph, Mo.

FOR SALE—7500 pounds of bees in combless packages, starting April 1, 1917. Better write us before it is too late to have your order booked. Marchant Bros.,
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MY BRIGHT Italian queens will be ready to ship after April 1st at 60c each. Send for price list. Safe arrival and satisfaction guaranteed. M. Bates, Rt. 4, Greenville, Ala.

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YEAR old Italian queens, $6.00 a doz. Bees by the pound April and May delivery. Good bees, queens, service, and satisfaction always. Write for prices at once.
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MINNESOTA bred Italian queens. Virgins, 45c; mated, $1.00. O. C. Wandrie, Frazee, Minn

ITALIAN BEES, 20 colonies, $5.00 each, if all are taken. John Fagin,
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TRY my very best Caucasian-Italian tested queens at $1.00 each. Hybrids at 25c each.
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BEES WANTED, any quantity, in N. J. on line of C. R. R. of N. J. or Penn. R. R. State kind of hive and price to T. Edward Diener, 28 Jacques St., Elizabeth, N. J.

FOR SALE—100 colonies well kept Italian bees. Are located on city lot. Too many stands. All in 10-frame hives.
Geo W. Landers, Clarinda, Iowa.

HEAD your colonies with some of our vigorous young three-banded Italian queens. Untested, June 1, $1.00; per doz., $9.00; nuclei and full colonies. Satisfaction guaranteed.
A. E. Crandall & Son, Berlin, Conn.

GOLDENS that are true to name. Write for testimonials; one race only. Unt., each, 75c; 6, $4.25; 12, $8.25; 50, $32.50; 100, $60. Tested, $1.50. Sel. test., $2.00. Breeders, $5.00 and $10.
Garden City Apiaries, San Jose, Calif.

FOR SALE—2-fr. nuclei 3-band Italians with queen, $2.25; 1-lb. bees with queen, $1.65. Hoffman frames wire and foundation at catalog prices. J. B. Marshall & Son,
Rosedale Apiaries, Big Bend, La.

LEATHER colored 3-band Italian bees, $1.25 per pound. Tested queens, $1.00; untested, 75c each; 2-fr. nuclei, $2.00; extra combs, 15c each. Delivery after April 15.
C. H. Cobb, Belleville, Ark.

LEATHER COLORED "Nutmeg strain of bees and queens. Tested queens April-May $2.00; after, $1.50; untested, $1.00 Return mail. A. W. Yates,
3 Chapman St., Hartford, Conn.

QUEENS—Best Italians, one for 50c; 12 for $5.50; virgins, one for 25c; 12 for $2.75. Orders taken now; filled in rotation beginning May 1. Any of my queens proving mismated, replaced free. A. F. Bray, Kelso, Tenn.

FOR SALE—The apiary of bees belonging to the late R. A. Elliston, consisting of 218 colonies, $5.00 per col., also supplies. If purchaser wishes, they can be left on present location the coming season.
Mrs. Robt. Elliston, Princeton, Ill.

TO INQUIRERS:—I sell no queens directly but have an arrangement with the Stover Apiaries, Starkville, Miss., which I keep supplied with best breeders, and they can supply you with my stock.
C. C. Miller, Marengo, Ill.

GOLDEN Italian Queens by June 1st. Untested, 75c, or six for $4.25; doz., $8.00. Select untested, $1.00. Tested, $1.25; six for $7.00. Breeders, $5.00. Pure mating guaranteed. Send for circular. J. I. Danielson,
Fairfield, Iowa.

BEES FOR SALE—A number of well established apiaries in Frio, Bexar and Atascosa, Texas, in the mesquite and guajillo belt have been listed with us for sale on their present sites. Can also furnish bees in car lots.
Southwestern Bee Co., San Antonio, Tex.

MY BRIGHT Italian queens will be ready to ship April 1 at 75c each; virgin queens, 30c each. Send for price list of queens. Bees by the pound. Safe arrival and satisfaction guaranteed. W. W. Talley,
Rt. 4, Greenville, Ala.

GOLDEN QUEENS that produce Golden Workers of the brightest kind. I will challenge the world on my Goldens and their honey-getting qualities. Price, $1.00 each; Tested, $2.00; Breeders, $5.00 and $10.00.
2Atf J. B. Brockwell, Barnetts, Va.

GOOD ITALIAN QUEENS—Tested, $1.00; untested, 75c. One-pound packages with untested queen, $2.25; 2-lb. package, $3.25. One-pound package with tested queen, $2.50; 2-lb. package, $3.50. Nuclei with untested queen, 2-frame, $3.25; 3-frame, $4.00. With tested queen, 2-frame, $3.50; 3-frame, $4.25. We can please you. G. W. Moon
1904 Park Ave., Little Rock, Ark.

HONEY AND BEESWAX

SUPPLIES.

SITUATIONS.

WANTED

Crop Reports and Market Conditions

Questions sent out this month were as follows:

1. What is the condition of the honey market?
2. How large have winter losses been?
3. What is the condition of honey plants compared to normal?
4. Are beekeepers making much increase?
5. Are many turning from comb to extracted?
6. What has the honey crop been, so far?

Many more reports were received than last month. A summary by subjects follows:

THE HONEY MARKET

New England reports the demand exceedingly good, with practically all holdings sold. What comb honey there is left is expected to be disposed of before the new crop comes on. In New York and other eastern states conditions are the same. Honey is all cleaned up in the south, but through the central Mississippi states comb-honey seems to be of slow sale and many beekeepers fear they will not be able to clean up all stocks before the new crop comes on. In the west conditions have improved greatly. All extracted is sold long ago, and most of the comb is out of the hands of producers. One locality in Colorado reports two cars of comb still on hand. All in all, however, the situation, even in the comb-honey line is greatly improved over a year ago. The large markets are not glutted with comb-honey as a year ago, though prices range very little if any better. Texas producers report considerable honey of the 1917 crop sold ahead (bulk comb) and at satisfactory prices. The demand for extracted is excellent everywhere. In fact, extracted honey seems to be gaining in favor with the consumers. No extracted is offered anywhere except to supply regular customers, and this at a much increased price.

LOSSES OF WINTER

Where bees have had a flight in the North and East, losses seem to be under normal. But a large part of the North has had a continuous cold, with no flight, and, though the bees went into winter in the best possible shape, there is danger of considerable losses if spring does not open soon. One report from Wisconsin of a 50 per cent loss is certainly above the average.

Conditions have materially improved in the Southeast and reports now agree that losses were small, probably less than normal. The same is true of Texas, which reports generally less loss than last year. Uvalde county seems to be the exception.

It is too early to determine the losses in the North and West, owing to excessive snows and prolonged cold. Several reporters intimate that the loss is apt to be above average.

California has suffered from unseasonable, cool weather, and there have been many cases of spring dwindling, there being two reports of whole apiaries lost from this cause. Losses have been above average, as they have in Washington and Oregon.

CONDITION OF HONEY PLANTS

In all sections north of a line passing through Central Iowa and northern Nebraska, there has been a great amount of snow, which bodes well for excellent condition of honey plants when spring opens up. This is also true of the whole west, including Colorado.

In the districts comprising Nebraska, Kansas, Missouri, Illinois, Tennessee and Kentucky, the amount of winter moisture has been small and clover has suffered as a consequence. Honey-plant conditions are not up to last year. Recent rains have made some improvement in the last two weeks.

The southeast has recovered from the early frosts previously reported and honey-plant conditions seem to be normal. A report from Florida states that the outlook is better than a year ago.

In Texas, the horsemint crop is a total failure, except in the Goliad district, where there is some chance. Mesquite is almost a month late, owing to the backward spring, but prospects for a crop are excellent, as it requires dry weather. The Guajilla prospects in the Uvalde district, seem to be poor. Crop prospects for the state should be probably 85 per cent of normal.

In California, recent rains have bettered the prospect, which is now about 80 per cent of normal. A late spring has retarded growth. All sections must have more rain to secure a good crop. Oranges will soon be in bloom.

INCREASE

There will be no general phenomenal increase by veteran beekeepers in any locality, although some are increasing as fast as they can equip to handle more bees. Beginners are increasing their holdings, generally, in the Middle West.

EXTRACTED TO COMB

There is a general tendency toward the production of extracted honey to supply the increased demand. One very prominent Wisconsin beekeeper is discontinuing comb honey for extracted, as is one in Illinois. The change throughout the country should be large enough to be noticeable.

HONEY CROP

The season is late in both California and Texas, and no honey has as yet been harvested. One reporter in Florida states that his earliest crop is coming in and that it will be 25 per cent better than in 1916.

In Texas, where bulk-comb honey is produced almost exclusively, producers are aiming to get a better price than in 1916, when practically all stocks were sold by December 15.

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